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# A Case Study of Inhibitors for Information Flow in Global Product Portfolio Management

*Master of Science Thesis*
*in the Management and Economics of Innovation Programme*

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# Abstract

Managing global product portfolio involves strategic decisions related to products evaluation, selection, and prioritization. In order to make best possible decisions, portfolio managers have to access information from different sources. In particular, accurate information related to customers' demands, competitors' analysis, and markets' trends is vital to create a basis to support decision makers. Inhibitors for the flow of information can lead to poor decision making and consequently low performance and efficiency in global product portfolios.

The purpose of this study is to identify relevant inhibitors for information flow when managing global portfolio. A pre-study was done to investigate patterns of information flow in global product portfolio settings. Subsequently, a case study was carried out at a company that serves global market in a mature industry. Social aspects were regarded in this study. Theories related to formal system and actual behavior were applied to comprehend characteristics of organizational members' behaviors when sharing information.

Relevant inhibitors for information flow when managing a global product portfolio identified in this study are conflicting goals, fear of punishment, lack of trust, geographic distance and language barriers, lack of proper information technology, inadequate organizational structures and processes, and lack of time. The inhibitors were considered relevant because they were recurrent topics in the findings of this study, and they were found useful to explain how people's behavior can hinder information flow.

This study confirms a need of including social aspects both in the literature and on the practice of global product portfolio management. Moreover, this study draws attention to the fact that information inaccuracy is not a synonym of failure and it could have beneficial effects when constructive discussion is built around it. Awareness of information flow inhibitors can lead to positive reflection and further analysis of market situations that can help portfolio managers to understand better the context of their global operations.



**Keywords**: *information flow, information inhibitors, product portfolio management, formal system, actual behavior, organizational behavior*

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# Contents

# 1 Introduction

Research on *product portfolio management* has focused on product evaluation, selection, prioritization, and strategic alignment of the mix of products offered by organizations. Due to the existing competitive and uncertain environment, managing product portfolio is considered as a dynamic process, that has to be carried out under continuous revisions of strategies and market analysis (Cooper et al., 2001).

Managing product portfolio involves *complex decisions* (Closs et al., 2008). Different factors, such as risks, returns, time-to-benefits, and portfolio balance, have to be taken into account when making decisions about the portfolio of products. Therefore, portfolio managers have to gather *information* from different sources and functions in the organization to create a basis for their decisions (Cooper et al., 2001). When it comes to multinational organizations and management of global product portfolios, the access to information becomes even more difficult (Riege, 2005).

Even though information is central for managers to make decisions related to the product portfolio, the literature has not mentioned enough what the *inhibitors for information flow* are in the field of product portfolio management. Decisions about characteristics of new products, phasing in and phasing out products, launches, prices, markets, customer targets, and facelifts demand the support of reliable information (Cooper et al., 2001). Inhibitors are defined for this study as any event, action, or phenomenon that prevents information flow or lower the quality of information. Therefore, overcoming inhibitors for information flow is imperative in the context of product portfolio management.

A study of the inhibitors for information flow requires a social perspective, since information does not only exist; it is created and shared by people. Usually the social and psychological factors, which are related to the way that people behave and share information in organizations, are not the focus in research on product portfolio management.

Hence, in order to understand the inhibitors for information flow, it is needed to consider the reasons and the willingness that people have when sharing information. In fact, people are not always willing to share information, due to different reasons. For example, one reason why people decide to not share information could be that they are not sure about what content they should share. Another reason could be that people do not share information because of their self-interest (Buchanan & Badham, 1999a).

Theory in organizational behavior can be a useful approach to analyze *people's willingness to share information.* In particular, some theories in group behavior differentiate between the formal system of organizations and the actual behavior of organizational members. The *formal system* relates to the organizational design, which is given to individuals in forms of goals, blueprints, tasks, processes and structures in organizations. On the other hand, the *actual behavior* relates to how the organizational members actually act. More often than not, distortions between formal system and actual behavior occur in organizations (Homans, 1950; Shani & Lau, 2009).

Bringing these concepts to the context of information flow, it is seen that distortions between actual behavior and the prescribed behavior of the formal system also happen. Therefore, even though organizational structures and processes are designed to promote information flow in organizations (formal system), different actual behaviors can appear. Possible actual behaviors are that people share properly information, people withhold information, people share distorted information, and so forth. Hence, the actual behavior is that individuals often shape the information that they share with others in an organization.

This study was commissioned by Alpha, a multinational firm that serves global market in a mature industry. The study was carried out at Alpha's global product portfolio management settings. Around two years ago, Alpha decided to change from managing its product portfolio locally to implement a global product portfolio. Therefore, managing a global product portfolio is a recent challenge at Alpha.

A centralized Product Portfolio Unit was created at Alpha with the goal of ensuring the right mix of products in the portfolio to fulfill customers' demands worldwide. The Product Portfolio Unit depends on information from sales organizations located in different Regional Units around the globe, besides other sources of information. Given that proper flow of information between the Product Portfolio Unit and the Regional Units is essential for the decisions related to the product portfolio of the company, investigation about the inhibitors for information flow in global product portfolio management at Alpha became required.

## 2 Purpose

The purpose of this study is to explore the inhibitors for information flow in product portfolio management. The focus of the work is information exchange between subsystems of the same company, in particular between a central product portfolio unit and sales units dispersed globally

(intra-organizational). The information exchanged in this setting supports decisions about evaluation, selection and prioritization of product development. This study is limited to the analysis of employees' experiences, subjective interpretations, documents from the studied company, and observations of meetings where centralized portfolio units exchange information with sales and product managers from different regions.

The flow of information in global product portfolio management cannot be fully understood without considering people's willingness to share information and the reasons why people share information. Therefore, this investigation looked at a wide array of inhibitors, which may be relevant on global product portfolio settings, from a social perspective. In other works, taking into account that people do not act as machines (Scott, 1998). The inhibitors will be regarded as relevant if they are useful to explain how people's behaviors can hinder information flow. As a result, this work aims at answering the question:

***What are relevant inhibitors for information flow when managing a global product portfolio?***

This work begins by introducing the theoretical foundations employed in this study. This is followed by the description of the methodological considerations for the collection and analysis of the empirical data. Then an outline of the setting of the study is offered, in particular reference information of the company of the case study. After that, the analysis and results are presented together to seek for clarity of the results. Next, discussion regarding the theory employed and the main findings are offered, to finally close with managerial implications and conclusions.

# 3 Frame of Reference

The aim of this study is to investigate what the inhibitors for information flow are when managing a global product portfolio. In this chapter, a frame of reference is provided to support the study. The frame of reference is organized in three sections. First, the theory of product portfolio management is introduced. Second, the concepts and models in organizational behavior are exposed. Third, concepts about information in organizations are presented.

## 3.1 Theory of Product Portfolio Management

This section introduces how different perspectives of product portfolio have been developed, from quantitative optimization problems to the current focus on business strategy. Then the definition of product portfolio management for this study is provided, together with the illustration of a generic

portfolio process. Subsequently, product portfolio management activities and common approaches are summarized. Finally the main challenges identified in the product portfolio management literature are presented.

### 3.1.1 The Evolution of the Product Portfolio Management

Modern portfolio theory was introduced by economist Henry Markowitz to refer to the combination of assets that maximize the expected return under uncertainty about the future performance (Markowitz, 1952). Since then the term portfolio has been used by other disciplines to address the problem of maximizing returns by means of balancing resources under uncertain conditions. In the case of product portfolio management different approaches has been used to select investments and maximize revenues while aligning the level of risk that firms are willing to take.

Simplified techniques such as the "growth-share matrix" were widely spread among practitioners in the 1970's and 1980's. This technique, proposed by the Boston Consulting Group, approached selection of products according to four categories of market share and growth. This was a prescription technique which examined the suitability of the product portfolio according to the proportion of products under each category (Morrison & Wensley, 1991). In parallel to simplified matrix techniques, complex quantitative models were developed in the field of operations research to approach the problem of optimizing investment of new product development. Despite of the growing number of models and interest of the academia in the field, these quantitative optimization models were poorly adopted by practitioners (Schmidt & Freeland, 1992).

Financial criteria like Net Present Value (NPV) or Return of Investment (ROI) are the most common approaches used by firms to evaluate portfolio decisions (Cooper et al., 2001; Killen et al., 2007). In these approaches, evaluation, selection and prioritization of product development investments are based on their expected future returns. However, financial methods are criticized because they ignore the non-monetary aspects of the portfolio, which leads to a myopic decision framework which amplifies estimation errors (Cooper et al., 2001) and hinders innovation (Christensen et al., 2008).

Economists have explored the problem of product variety from the angle of the consumer, the firm, the market, and the society. Economic models assume that individuals seek for variety and firms can increase profit by producing variety and differentiating their products from the competitors. In order to study the problem of optimum variety of products in firms, factor such as economies of scale, dynamic capabilities, and cumulative experience are considered (Lancaster, 1990). This approach is in line with the idea of linking the firm's strategy to the product portfolio decisions. In

words of Cooper and his colleagues (2001, p.361) "*portfolio management is the manifestation of your business strategy – it dictates where and how you will invest in the future.*" Studies of product portfolio practices have found that business strategy alignment approaches have presented better results in terms of new product development effectiveness when compared to financial or scoring/ranking methods (Cooper et al., 2001; Killen et al., 2007).

From this brief account, it is possible to perceive how product portfolio management has experienced a change in focus from early output oriented models, to process oriented models. The output oriented models usually had focus on single decision events based on assumed fixed criteria. Main criticism for these models is that they overlook the actual way decisions are made in practice in organizations. Process oriented models focus on the decision process and recognize that product selection (project selection in R&D) is a complex system which structures and functions are strongly interrelated (Cooper et al., 2001; Schmidt & Freeland, 1992). The latter focus supports the approach taken in this study, which is portfolio management as a dynamic process under constant revision to secure the alignment of the portfolio with the business strategy.

### 3.1.2 Product Portfolio Management Definition

Product portfolio management is not a linear process, but a recursive process that needs to recognize previous experiences to keep alignment with the strategy and to adapt to uncertainty conditions. The following definition is adopted as a comprehensive definition of the processes and sub-processes that guide product portfolio management activities:

> "*Portfolio management is a dynamic decision process, whereby a business's list of active new product (and R&D) projects is constantly up-dated and revised. In this process, new projects are evaluated, selected and prioritized; existing projects may be accelerated, killed or de-prioritized; and resources are allocated and re-allocated to the active projects. The portfolio decision process is characterized by uncertain and changing information, dynamic opportunities, multiple goals and strategic considerations, interdependence among projects and multiple decision makers and locations"* (Cooper et al., 2001, p.362).

To complement the definition above, the Project Management Institute's description is used in this study to summarize the main portfolio management processes:

> *"Centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives"* (PMI, 2008a, p.9).

The process defined by the Project Management Institute (PMI, 2008b) identifies the organization's strategic plan as the input guiding the portfolio processes, which are divided in two main processes: aligning and controlling, and 14 sub-processes presented in Figure 1. The process emphasizes the continuous revision of projects with the corporate strategy. Alignment processes are about evaluating the value, prioritization, and relationship of the different components of the portfolio. Controlling is related to key performance indicators, levels of risk, and changes in the business strategy. The results of the controlling and monitoring are sent back to the strategic plan to reassure the alignment between projects and strategy. Although the process is rather linear, it includes feedback loops to alert about inadequate performance, risks, and strategic changes.

The PMI's standard for portfolio management is a comprehensive guide on the way portfolios can be structured and managed. When following this type of guide, it is worthy to take into account the effect of people in the process. The advice from authors like Engwall (2002) to be aware of the suitability of prescriptive methods is observed in this work. However, this study benefits from this kind of norm, by means of gaining an extensive overview of the processes in portfolio management, standard terminology, and foundations to determine the information flow and decision making requirements in product portfolio management. Normative and descriptive theories in product portfolio management are revisited in the discussion part of this report (see Product Portfolio Management Normative and Descriptive Theories).

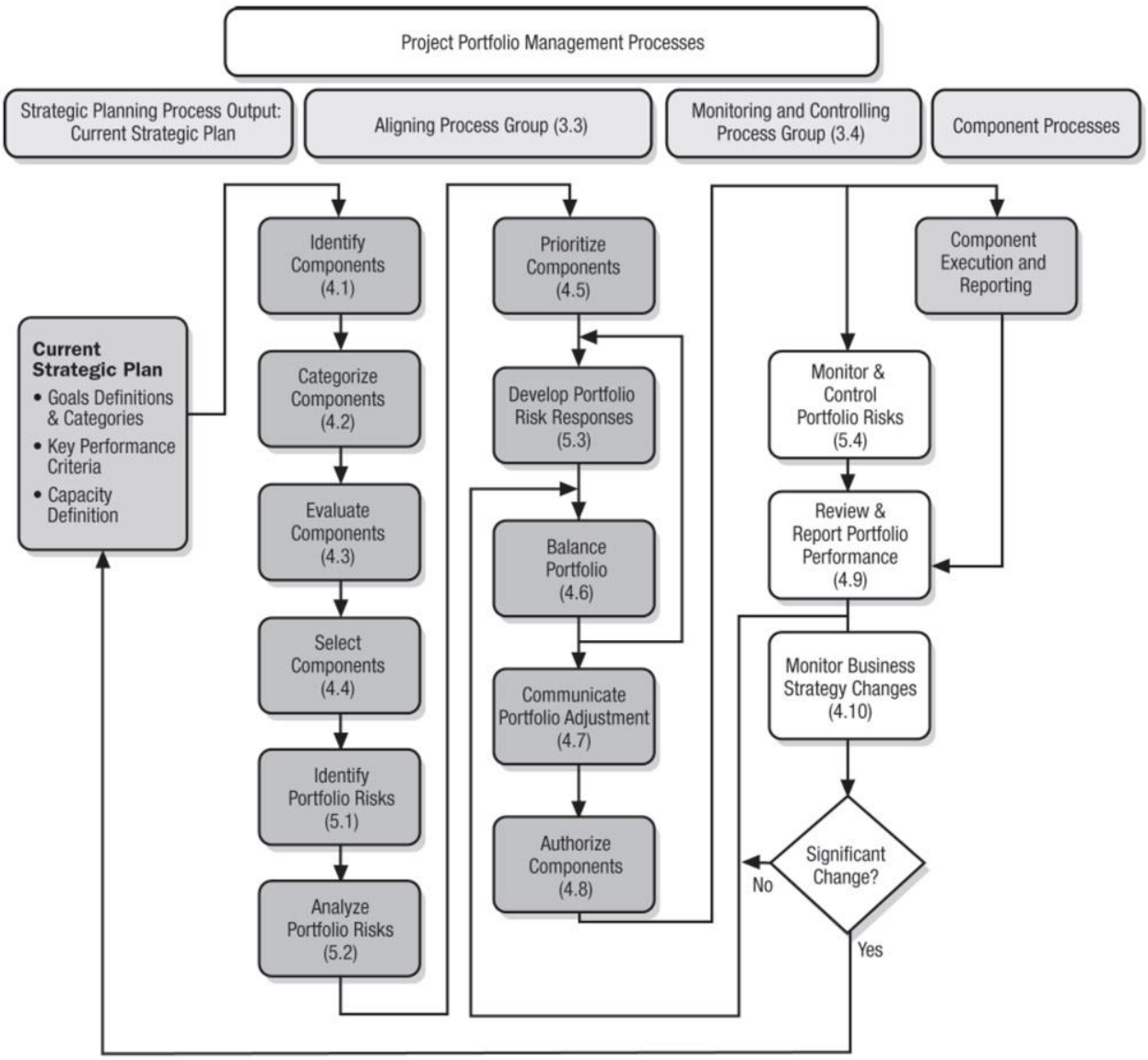


**Figure 1 Portfolio Management Processes (PMI, 2008b)**

### 3.1.3 Product Portfolio Management Activities

Product portfolio management has different functions and scope in different organizations. In a broad sense product portfolio management involves two main activities: new product development, and post-launch product management.

*1) New product development (NPD)* is the early phase where product concepts are identified, evaluated, categorized, and selected. In this phase, decisions about specifications, technology, components and architecture are made (Verganti, 1997). Several activities take place in this stage: idea generation, idea screening, resource allocation, technical feasibility, competitiveness analysis, testing of the concept in the market, and financial assessment (Cooper, 1990; Cooper et al., 1999).

It is also during the early stages of new product development that main decisions about the outcome of the product are made, but it is also the period when uncertainty is the highest. Once decisions are made in this phase, it is too costly to make changes later in the implementation. Figure 2 illustrates the relationship between the cost of corrective actions during development and the uncertainty of the decisions' outcome (Verganti, 1999).

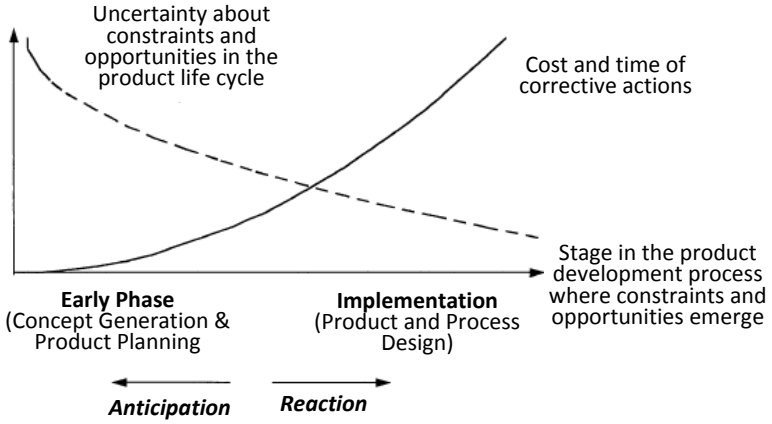


**Figure 2 Uncertainty and Cost over Time in Product Development Process (Verganti, 1999)**

McCarthy et al. (2006) present three frameworks for the decision making process in new product development: the linear, the recursive, and the chaotic. The *linear* is described as sequential series of decision events. The *recursive* recognizes that connection and boundaries in new product development activities are not rigid, and the need for feedback loops and iteration. The *chaotic* characterize new product development as a random and non-linear process, which output is irregular and unpredictable. The three frameworks can be seen as complementary and adequate for different stages of new product development process.

A well-known representative of the linear view and a widely spread process among practitioners is the Stage-Gate® model (Cooper, 1990). This model proposes new product development projects as a sequence of activities and decisions, which aims to evaluate the progress of projects and the validity of the business case in different points along the process (Figure 3). Cooper's extensive literature in new product portfolio management constitutes both a prescriptive and a descriptive approach (Cooper, 1990; Cooper et al., 1999; Cooper et al., 2001; Cooper, 2006). The Stage-Gate® model can be understood as prescriptive or normative approach, while different studies carried by the author and his colleagues supplement the model with insights on how product portfolio management actually operates. Aspects such as stakeholder commitment, resource allocation, effectiveness of different methods and criteria, long and short term balance, and strategy linkage are explored in those studies.

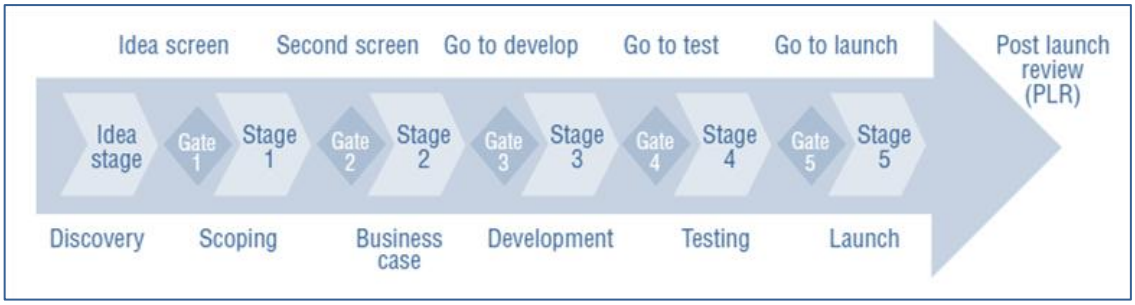


**Figure 3 NextGen Stage-Gate® - Five-Gate Framework for Significant New Product Projects (Cooper, 2006)**

2) *Post-launch product management* activities are the ones carried once a product is launched. For instance, coordination with operations, product performance tracking, product enhancements and derivatives, marketing, after-sales, and product withdrawal are part of the post-launch product management. As defined by the Product Development Management Association, product life-cycle management is about organizing changes in product features, in the marketing mix, and in manufacturing operations to maximize profits over the product lifespan (Kahn et al., 2005). Moreover, different functions of the organization like R&D, marketing, finance, operations, and customer service are involved in activities, such as product performance tracking, product enhancement and derivatives, and product withdrawal (Kahn et al., 2005; Closs et al., 2008; Haines, 2008).

Both activities, new product development and post-launch management, are critical to firms and both require experienced and adequate resources. Neglecting one of these activities is detrimental for the organization performance (Kahn et al., 2005). Consequently, in this study product portfolio management processes deal with issues of both, new product development and post-launch product management.

### 3.1.4 Challenges in Product Portfolio Management

Research in product portfolio management suggests that decisions in the field are based on three criteria: product, market, and financial, and that over-emphasizing one criterion is linked to poorer performance (Cooper et al., 1999; Ronkainen, 1985). These *goals can be conflicting* and the decision making often requires combination of qualitative and quantitative methods, and the criteria of different groups inside and outside the organization. In addition, strategic alignment is expected. As indicated by the Product Development Management Association (PDMA, 2006), product portfolio is *"a set of projects or products that a company is investing in and making strategic trade-offs against."* Projects that are not aligned with the strategy will not contribute to the competitiveness of the firm, despite of their execution (Hayes et al., 2005).

Moreover, complexity in decision making in product portfolio management relates to the *interdependency of projects*, which implies that certain projects need to be done before others can be started. Related to this issue is the prioritization of human, technical and capital resources. Taking more projects than the available resources is a common practice in organizations (McGrath & MacMillan, 2000; Hayes et al., 2005). In addition, projects with low marginal value such as enhancements and modifications often consume the resources of long term, high potential projects. No focus and strong reluctance to kill projects also result in *large number of projects* increasing time to market and making decision making more complicated (Cooper et al., 2001).

*Balancing of short term and long term* goals is one of the main challenges in management. Similarly, in product portfolio management allocating resources in future oriented projects, when urgent profitable task are also in desperate need of those resources is a constant dilemma (McGrath & MacMillan, 2000).

*Commitment of senior management* and cooperation between the different functional areas is essential to product portfolio management. Despite of the sometimes conflicting goals of the sales organization and the product portfolio management, the link between these business function is central. It is difficult for portfolio managers to apply their strategy if the sales organization does not cooperate with it. Decision making is a daunting task due to the uncertainty surrounding the process, diverse goals and agendas, and the multiple stakeholders and locations (Archer & Ghasemzadeh, 1996; Cooper et al., 2001).

Product portfolio management that lacks procedures and has *not clear established decision processes* finds more resistance and experiences poorer results (Cooper et al., 2001). Decision support systems are a critical tool for portfolio managers, product developers, post-launch managers, and anyone needing reliable and timely information to make decisions in their jobs. *Information systems* allow decision making based on facts and also save time, however these systems are required to be credible and comprehensive. Information systems that consider technical and social aspects are more likely to experience higher level of credibility and usage among decision makers (Closs et al., 2008).

Finally, product portfolio management improvement is difficult if *feedback from the post-implementation is not considered*. It is necessary to evaluate the performance of launched products. Tracking customer experience and satisfaction is an important after-sales activity and it is also a necessary input for future decisions about the permanence of the products in the portfolio (Kahn et al., 2005). Main challenges in product portfolio management are summarized below:

- Multiple and often conflicting goals for the definition of the portfolio
- Difficulties of determining trade-offs among different criteria
- Large number of projects and interdependences among projects and resources
- Long and short term balance (comparing projects at different stages of maturity)
- Involvement of several individuals with different perceptions
- Unreliable metrics and tools
- Insufficient post-implementation feedback

## 3.2 Organizational Behavior

In this section, an organizational designs model is first introduced, followed by some details about politics in organizations. Subsequently, the concepts of formal system and actual behavior are explained. Finally, the impact of politics in the formal system and actual behavior is presented.

### 3.2.1 New Macro Organizational Design Model

Organizations are commonly defined as social structures created by individuals collaborating to pursuit specific goals. Organizational participants are individuals who receive incentives to contribute to the achievement of the organizational goals (Barnard, 1938). Achievement of organizational goals can be measured by organization performance. The performance is regarded in organizations in terms of productivity, quality, satisfaction, and/or growth. Different factors affect the result of performance: external environment, strategies, organization structures, management support processes, core processes, and people.

Balanced attention to organization processes and structures on one side and individuals issues on the other seem to be vital for companies to adapt to changing environment, and survive. Moreover, a suitable organizational design is important and can be decisive for organizations succeed (Shani & Lau, 2009).

Shani and Lau (2009) addressed the challenge of designing organizations. They developed the New Macro Organizational Design Model that expands the work of Galbraith (1973) and Homans (1950) to describe a process of organization design based on decision choices. The Figure 4 illustrates this model.

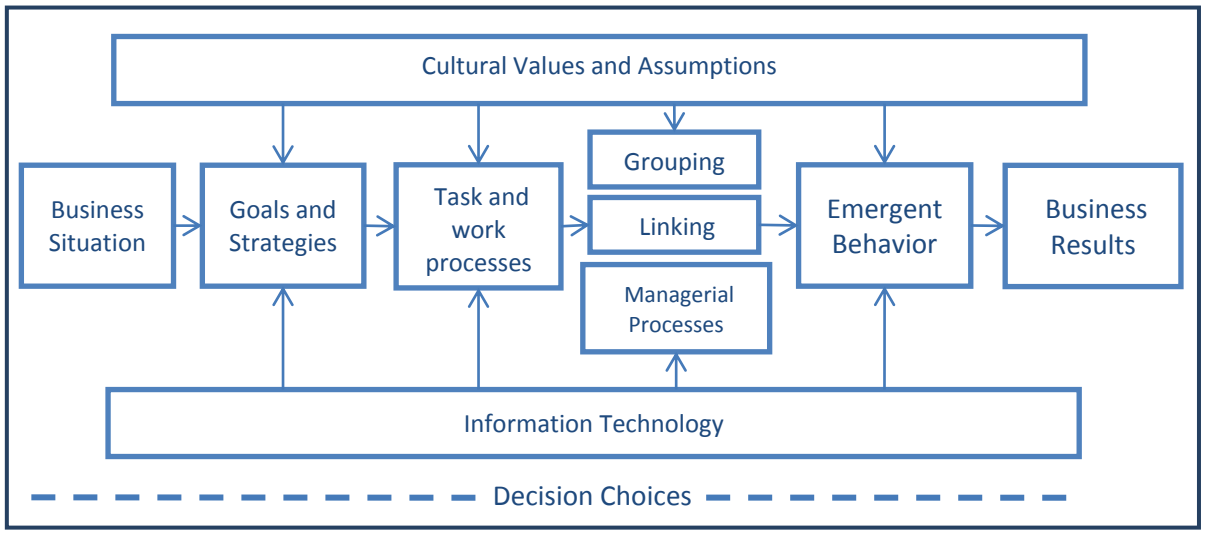


**Figure 4 New Macro Organization Design Model. (Shani & Lau, 2009, p.376)**

In their framework, the business situation is used to define the goals and strategies of the organization, which influences the definition of tasks and work processes. Task and processes in turn motivate the ways in which employees are grouped, activities are coordinated, and processes are organized. Information technologies and cultural variables are also important drivers for all design choices. Emergent behavior and business results are directly tied to the quality of managerial decisions made throughout the design choices (Shani & Lau, 2009).

From the model developed by Shani and Lau (2009), two main points should be highlighted 1) there is a correlation between the emergent behavior of organizational members and the business results, and 2) decision choices are crucial in all the process of organizational design.

### 3.2.2 The Rational and Irrational Model

Shani and Lau (2009) also studied the behavior of people from a perspective of rationality, where individuals behave as they ought to behave. From the rational perspective, people behave according to objectivity, logic, and practicality. Alternatively, a perspective of less rationality or irrationality tries to understand why individuals do not behave according to the rational models of the organization. In this perspective, people behavior is based on emotions, feelings, and needs. Figure 5 illustrates some of the factors related to the rational and irrational side of individuals' behavior. Awareness of these factors contributes to studies about of organizational behavior (Shani & Lau, 2009).

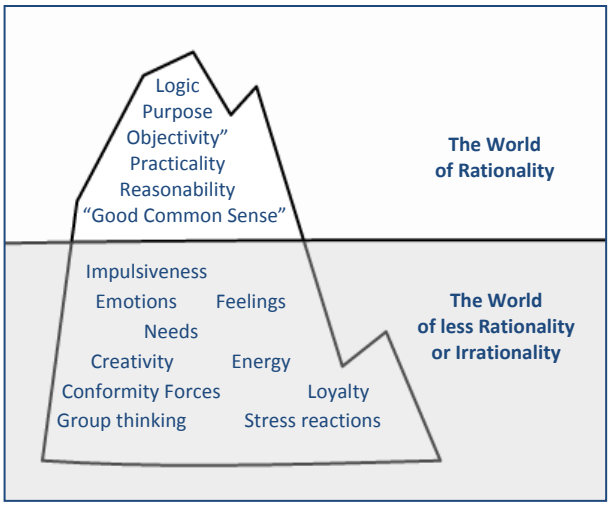


**Figure 5 Organizational Behavior Iceberg (Shani & Lau, 2009, p.16)**

### 3.2.3 Politics in Organizations

Political behavior is the norm rather than a variant in organizations. Even though political behavior plays a considerable role in organizations, it is not always recognized or openly admitted (Buchanan & Badham, 1999a). There are different definitions and connotations of political behavior in organizations, a general one is political behavior as the activities that are not part of the individual formal role in the organization, but that seek to influence the distribution of advantages, or disadvantages within the organization. Political behaviors can be legitimate, such as exchanging favors, forming coalitions and seeking sponsors at upper levels. But they can also be less legitimate behaviors, such as threats and sabotages. Therefore, managing successfully political activities is necessary for achieving organizational effectiveness (Farrell & Petersen, 1982). Furthermore, taking into consideration political aspects can help to better understand the behavior of people in organizations.

People usually are involved in diverse games taking place in organizations at the same time. For instance, individuals may pursuit organizational goals, but at the same time take part in competition, informal networks, cunning, deceit, as well as pursuit moral ideals and high aspirations. Buchanan and Badham (1999) argue that not all 'tricks' are 'dirty tricks', thus adequate assessment of organizations must explore the different dimensions of individuals' behavior, and the impacts of these behaviors in how organizations are designed. Denying individuals´ needs and self-interests does not make the phenomenon less potent (Buchanan & Badham, 1999b; Pinto, 2000), and avoiding open discussion about the conflict and dysfunctional behaviors do not necessarily facilitate work in organizations (Argyris, 2004).

It is worth to notice that The New Organizational Design Model and the Rational and Irrational Model developed by Shani and Lau (2009), presented in the previous sections, are incomplete when

it comes to considerations about politics in organizations. The New Organizational Design Model does not recognize that the emergent behavior of the organizational members influences also the decisions about the design of the organization, and activities such definition of goals and task, see Figure 4. While in the Rational and Irrational Model, political behavior is not clearly addressed, leaving doubts whether political behavior is irrational or rational, see Figure 5. Despite these models lack to certain extent the political sensitivity, they complement to the analysis of the organizational behavior. These weaknesses about the New Organizational Design Model and the Rational and Irrational Model will be further explored in the discussion part of this report (see Assessing Critically the Rational and Irrational Model and the New Macro Organizational Design Model).

### 3.2.4 The Formal System and Actual Behavior

The behavior of group members must not be considered as discrete behaviors of unrelated individuals, it needs to be seen as a *system of behaviors* or as a social system. It is important to emphasize that *"whenever a group of two or more people come together to perform a task, the web of group dynamics spontaneously begins to spin*" (Shani & Lau, 2009, p.329).

According to Homans (1950), the social system constitutes two parts: an external system and an internal system. The external system comprises the required behavior imposed on a group by external sources, such as a manager, the blueprints, or the organization. The external system consists in the *formal system* of an organization.

The *internal system* includes all the things that people do, their feelings and attitudes that are spontaneously elaborated and standardized by the members of a group. "*The internal system is the elaboration of group behavior that simultaneously arises out of the external system and reacts upon it*" (Homans, 1950, p.109). Homans (1950) called the system "internal" because it is not directly conditioned by the environment. The internal system comprises all the acts of the organizational members in the organization (Homans, 1950), which in this study is called the *actual behavior.*

It is important to highlight that there is always a certain degree of distortion between the formal system and actual behavior of an organization. Distortions happen since formal system cannot be perfectly design to fit every single possibility of individual's and groups' action (Homans, 1950; Kimberley & Evanisko, 1979; Morgan, 1998). These distortions between formal system and actual behavior can occur due to different factors, such as self-interests of individuals and confusions regarding the formal system.

In this context, the interesting question is not if there is or not distortion, but how distorted is the actual behavior of individuals when comparing to the prescription of the formal system. Knowing the degree of the distortions in organizations is useful for managers in many ways. For instance, the fact that there is a high degree of distortions between the formal system and actual behavior in one department can be a clue that there might be self-interest or confusions about the formal system in the department. Therefore it is worth for the manager to investigate further people' behaviors and the formal system in the department, to understand better the reasons and the consequences of the distortions.

Depending on the basis of judgment, the distortion between the formal system and actual behavior can be viewed both as positive and negative (Wickenberg, 2004). For instance, the boss of a sales department asks for their subordinates to send to him or her accurate estimates for sales for the next month. This is a request made in the formal system of an organization. However, the subordinates decide to send to their boss estimates lower than the reality. This is the actual behavior of the subordinates. There is a distortion between the formal system and actual behavior, since the subordinates did not follow the request of sending accurate information. In the perspective of the boss, this distortion has a negative impact because he or she did not have access to the accurate information that he or she needed. On the other hand, in the perspective of the subordinates, lower estimates have positive impact on their job because they will have to struggle less to achieve the next month sales goal, in case the boss uses this information to define the goals of the team for the next month.

It is important to notice that political behavior can be reflected in both the formal system and actual behavior of individuals. The establishment of formal processes is subject to political reasons, in the same way that people's acts can be guided for self-interest. The assessment of political behavior can help to better recognize the distortion between the formal system and actual behavior and to better predict the actions of individuals. Hence, understanding of the distortion between the actual behavior and the prescribed behavior of the formal system is crucial when studying organization.

### 3.2.5 Politics in Formal System and in Actual Behavior

An account of Brunsson (2007) about the budgeting process in a Swedish municipality exemplifies the distortion of the formal system and the actual behavior. It also illustrates how the actual behavior that emerges from different groups affects the performance results of organizations. This description reflects some of the consequences of political behavior in particular, conflicting goals, power relationships, individuals' self-interests, and ambiguity in organizations.

A small municipality in Sweden was about to initiate its budget process under a new ruling coalition. The new coalition had promised no tax increases, due to the fact that this municipality was already among the municipalities with the highest tax rates in the country. Special attention was given to the budget preparation with confidence that if a low budget negotiation was achieved, this would control expenses and the taxes would not need to be increased. After a year of negotiation the final budget included heavy cost increases, meaning that taxes would be increased and that the new coalition had failed. The budget process followed standard procedures, which means bargaining between actors pursuing different interest and occupying different roles. In budgeting theory there are guardians of the cash box (in this case the leaders of the new ruling coalition), and champions that advocates for different projects and departments. Champions were not worried about bottom-line numbers and were not willing to sacrifice their projects to avoid a tax raise. And as in many organizations, champions outnumbered guardians. Champions had no inference about others departments and were not interested in challenging them. Thus, guardians were also responsible of balancing the resources between departments. The guardians suspected that there were ways of cost cutting and improving efficiency in the departments, but they were not knowledgeable enough to hit on appropriate measures. In periods of stagnation the responsibility of cutting allowances and terminating activities is highly unwanted. Therefore, to avoid blame for particular cutbacks and also due to lack of information, the guardians gave instructions on a general reduction in the budget. In other words, they asked for cutbacks, but without saying where or how. Champions rapidly reacted by threatening guardians with affecting very visible issues such as school milk. And if guardians suggested cuts, champions always had better arguments to decline those suggestions since they knew the operation better. It was difficult for the guardians to prove that an operation was not necessary or that it could be done more efficiently, and it was very hard to show that champions were responsible. In summary, the budget process was determined by two factors the ease with which the guardians could be held responsible, and the champions' superior knowledge. At the end of the budget year, the champions had succeeded in getting so much money that they had been unable to spend it all (Brunsson, 2007) .

The budgeting process from the story evidence how challenging is for organizations to achieve goals, because people' and organizational' interests are not always aligned. In other words, this story

points the gap between formal system and actual behavior in organizations, and the politics behind this gap. On the one hand, a formal process was run with clear instructions and clear goals. On the other hand, conflicting goals and self-interests were at place making it difficult for the owners of the process to achieve the expected outcome.

This is a situation where employees stick to their interest regardless the organizational interests has been recognized and explored for a long time. For instance, the piece work dilemma in factories in the 19th century described how workers deliberately lower their rate of work as a mechanism to forward demands to employers (Smith, 1991).

Awareness of 1) the distortion between formal system and actual behavior, and 2) the reasons why there is this distortion can help managers to identify issues in the organizations. The outcome of a higher distortion is not necessarily poor for the organization. Rather, the outcome can be beneficial to the organization or to some of the stakeholders involved, depending on the basis of judgment. Therefore, after identified the distortions, a critical analysis of the situation is demanded to understand the reasons and the possible outcomes from the situation of distortion.

During the literature review it was identified a need of a theory that integrates four aspects: formal system and actual behavior, politics in organizations, interests of several stakeholders, and the overall good of the organization. This lack of an integrated theory will be further explored in the discussion part of this report (see The Need of an Integrated Theory in Formal System and Actual Behavior).

## 3.3 Information in Organizations

In this study, information is analyzed from an organizational perspective. Information is defined as a mean to change the way the receiver perceives something, to have an impact on his decisions and behavior (Davenport & Prusak, 1998). Information in organizations exists in the form of words, sentences, documents, emails, databases and computer programs. It is objective as it exists independently of the observer.

The flow of information episode entails the transfer of information from one person (the sender) to another (the receiver) by some chosen method (the channel). The channel can be for instance a telephone wire or computer signal, sound waves (the voice), or a written message (Robbins & Judge, 2007). Considering only its nature, information can be easily transferred, if the sender and receiver have the same or similar vocabularies and cognitive models (Huber, 2001). However, there are some inhibitors for information that should be taken into account.

Conversely to information, tacit knowledge is embedded in people´s minds and processes; it consists in experience that has been gathered over time due to incremental improvement and trial and error (Kogut & Zander, 1992; Grant, 1996). The process of transferring tacit knowledge has some specifics, when compared to the process of transferring information or information flow (Argote & Ingram, 2000; Osterloh & Frey, 2000). It is not in the scope of this work to cover the process of transferring tacit knowledge, but the explicit one, also named information.

According to Ackoff (1989) as cited in Rowley (2007), the content of the human mind can be classified into five categories: data, information, knowledge, understanding and wisdom. *Data* is defined as symbols that represent properties of objects and environment. *Information* is data that has been given meaning. Information is contained in descriptions and is inferred from data. *Knowledge* is the application of data and information, which answers "how" questions. Knowledge is information that has been appropriate by the user. *Understanding* is an appreciation of "why". And finally, wisdom is the ability to increase effectiveness in organizations. Wisdom demands judgment since it is an evaluated understanding. This work focuses on the study of the information phenomenon which is the process that takes place between the sender and the receiver of the information. Furthermore, this study does not intent to evaluate the appropriation of the information by the user.

In organizations, proper flow of information is demanded to the achievement of goals, which means that reliable and trustworthy information have to be available on time, for people that require it for acting, making analysis and decisions. The flow of information among employees is a determinant to create and leverage organizational collective wisdom (Cabrera & Cabrera, 2002; Cabrera et al., 2006). However, more often than not there is lack of proper information for decision makers. In this case, plausibility, intuition and "gut feeling" are used as alternative ways to support the decision choices, see Appendix 2.

The next section will explore inhibitors for the information flow in organizations. These inhibitors can become barriers to achieving organizational goals, and also bring dire consequences to organizations, such as inefficiency and poor decisions. Understanding the obstacles for transparent information flow in organization is essential. In works of Shani and Lau (2009), *"knowing what turns people off is as important as knowing what turns people on"* (Shani & Lau, 2009, p.10).

### 3.3.1 Inhibitors for Information Flow in Organizations

People play the most critical role in information flow. Organizational members decide about what information to share, when, how, and to whom to share the information (Scott, 1998). Besides

systems and structures, information flow involves individuals' self-interests, motivation and capabilities (Ferris et al., 1989; Riege, 2005; Maslow, 1970). For this reason, in order to better understanding of the inhibitors for information flow in organizations, it is useful to consider an organic perspective.

Literature about social psychology (Cabrera et al., 2006; Osterloh & Frey, 2000) and management (Brass, 1984; Szulanski, 1996; Huber, 2001) has widely discussed different inhibitors for information flow in organizations, from an organic perspective. Analyzing the inhibitors with organic lenses provides a more accurate guide to understand the actual behavior of people when sharing information and their real motivation (Homans, 1950; Scott, 1998). Political behavior can be expected when people are sharing information. In words of Davenport et al (2001) "*political behavior regarding information should be viewed not as irrational or inappropriate but as a normal response to certain organizational situations*" (Davenport et al., 2001, p.164).

Below it is reviewed important inhibitors for information flow. These inhibitors are presented in separate categories, although it is most likely that combinations of them are found in most organizations, since they are all intertwined. As time constrain limited the researches to explore a wider list of inhibitors, this report will focus on the most relevant inhibitors for this study. The main categories of inhibitors for information flow explored in this section are *conflicting of goals*, *fear of punishment, lack of trust, geographic distance and language barriers, lack of proper information technology, inadequate organizational structures and lack of time*.

#### *3.3.1.1 Conflicting Goals*

*Conflicting goals* is an inhibitor for information flow that stands behind several other inhibitors found in the literature, such as resistance to change (Szulanski, 1996), interdivisional jealousy (Szulanski, 1996), turf protection (Davenport et al., 2001), lack of cooperation (Grant, 1996), lack of commitment (Polanyi, 1966), lack of motivation (Davenport et al., 2001), and self-interest (Buchanan & Badham, 1999b).

Conflicts occur when individuals or groups of individuals perceive that their goals are blocked. Conflicting goals involving individuals and organization can lead higher distortion between formal system and actual behavior in organizations. In other words, individuals tend to do not act in accordance to the blueprints and established processes for information flow, if they believe that these blueprints and processes do not help them to fulfill their goals. Moreover, the information exchanged can be biased due to the individuals' goals and self-interests (Ferris et al., 1989).

Sometimes, conflicting goals can lead to arduous relationships. In this case, arduous relationship obstructs personal rapport, limits the numerous individuals' interactions, and creates additional hardship in the flow of information (Szulanski, 1996). The success of the information exchange depends on the ease of communication and on the "intimacy" of the relationship between the people involved, and this intimacy cannot be developed when parties involved have arduous relationship (Nonaka, 1994).

When exchanging information in organizations, at best scenario, individuals look forward to satisfy their own goals and the organizational ones at the same time, while in the worst, employees have the purpose of only fulfilling their own goals (Ferris et al., 1989). Employees often behave in a way strategically designed to maximize their short-term or long-term goals, which can be either consistent with or at expense of the organization´s interests (Ferris et al., 1989; Buchanan & Badham, 1999a).

Another view about conflicts and information flow is presented by Galbraith (1973). He argued that, in an overall level in organizations, conflicts do not have negative effects in information flow. Conversely, conflicts can be positive, because when employees face conflicts, they tend to share more information, since they share information about their preferences, about why they have preferences, and then search out new solutions which satisfy the criteria of as many people as possible (Galbraith, 1973). As a result, if employees keep their conflicts at a professional level, the organization can be benefited.

#### *3.3.1.2 Fear of Punishment*

*Fear of punishment* also hinders the flow of information in organizations. Fear of punishment emerges when employees perceive that they may be punished because of their mistakes. In organizations, sometimes responses to mistakes are not focusing on learning from them (Argyris, 1991), but on punishment and blaming game. "*Rather than recognizing and correct mistakes, they all too often are (…) blamed on others, explained away or punished*" (Riege, 2005, p.25). Consequently, due to the fear of punishment, people tend to withhold information that may lead them to be punished. The fear of punishment is related to power and control mechanisms in organizations.

Power is the ability to get what one wants even in the face of resistance (Markovsky et al., 1987; Weber, 1947). French and Raven (2001) define five different bases of power, which are: reward power, coercive power, legitimate power, referent power and expert power. *Reward power* has as basis the ability to provide positive reinforcement for desired behaviors. Conversely, *coercive power* reflects the potential to impose punishment. *Referent power* is personal oriented and it is related to

respect and admiration to an individual due to personal attributes with which others identify. *Legitimate power* is depersonalized, and it is based upon authority recognized due to hierarchical position in an organizational structure. And finally, *expert power* is a form of power resulting from recognized expertise (French & Raven, 2001).

Powerful managers may use their power to threaten others with punishment for undesirable behavior or to promise rewards for desirable behavior (Willer et al., 1997). One common outcome for power is that those without power come to resent those who use power, and to withhold information from them (Walker et al., 2000). Similarly to power, the level of control can be also an inhibitor for information flow. It is claimed that people have to be intrinsically motivated to share information. However, when people perceive that the organizations strengthen controlling aspects on employee's performance; intrinsic motivation for sharing information is reduced (Osterloh & Frey, 2000).

#### *3.3.1.3 Lack of Trust*

*Trust* is related to a mental distance between parties (Riege, 2005). The level of trust between employees seems to have a direct influence on the communication flow and in the information sharing in organizations (De Long & Fahey, 2000). For instance, communication and trust allow the organization and the employees to offer input without feeling inferior or unappreciated (Lebrow, 2005). It is mostly in informal networks that people trust each other, voluntarily share knowledge, information and insights with each other, and collaborate actively and willingly. However, sharing activities can neither be supervised nor forced out of people (Kim & Mauborgne, 2003).

Some authors argue that trust relies on the predictability of interactions that occur over time. The organizational members recognize how the others respond to situations and trust grows from this acknowledgment and relationship (Robbins & Judge, 2007). Long standing working relationship can increase the trust between organizational members; since it helps organizational members to predict coworker's responses to certain situations (Kramer & Tyler, 1996).

The *lack of trust* leads employees to be more guarded in their communications and to withhold information (Inkpen & Tsang, 2005). There are two main issues related to trust in the process of information flow.

1) Lack of trust on the receiver of the information. Senders may not trust receivers because they are concerned about how receivers will use shared information; in this case, senders will be less prone to share (Davenport & Prusak, 1998; Davenport et al., 2001).

2) Lack of trust on the validity of the information. When the receiver does not trust on the validity of the information that he or she gets, the transferred information will not be valuable and applicable in decision making (Riege, 2005). A fully detailed assessment of the validity of the information is useful, but it can imply high costs.

#### *3.3.1.4 Geographic Distance and Language Barrier*

*Geographic distance* can limit the possibilities of face-to-face interactions between people, and therefore inhibits the flow of information. Studies have identified that individuals prefer to use face-to-face interaction to transfer information, particularly when tasks are complex and ambiguous setting (Daft & Lengel, 1983). Face-to-face communication is the richest way to share information, because it brings both verbal and nonverbal cues, and also provides immediate feedback (Nonaka & Takeuchi, 1995). Face-to-face meeting can facilitate establishments of relationships and personal interactions, which can aid the transfer of information, interpretation of the environment, information processing (Daft & Lengel, 1983), and sense-making (Weick, 1995). However, geographic distance prevents the possibility of having frequent face-to-face meetings in global setting, when team members are located in different places on the globe.

*The language barrier* is also an inhibitor for information in global settings. The language is important when sharing information because *"language determines thought and if there is no way to express a particular concept in language, then that concept just cannot be used."*(Burr, 1995, p.24). Despite the selection of a common language in global organizations, people do not have the same capabilities and interest to master and use the common language.

#### *3.3.1.5 Lack of Proper Information Technologies*

*Information technology* relates to implementation of networks, information systems, tools, and devices designed for transferring information (Rachuri et al., 2008; Warnars, 2010). Technology enables greater precision, speed, and continuity, while reducing friction and information ambiguity (Riege, 2005). It can also provide interconnections among organizations' members across time and space barriers, through the use of specialized tools and media (Riege, 2005). It is known that technology can act as a facilitator to encourage and support information flow. The key issue, however, is to choose and implement an appropriate technology that provides a close fit between people and organizations, since technologies that works effectively in some organizations may fail in others (Riege, 2005).

The *lack of proper information* technology can prevents the storage of information as well as interconnections among organizations´ employees across time and space barriers (Cabrera et al., 2006). This situation is more problematic when there is extensive geographic distance between parties that have to share information (Davenport & Harris, 2007; Power & Sharda, 2009; Chaudhuri et al., 2011). Lack of integration of systems, lack of technical support and lack of compatibility between diverse systems and processes are examples of inhibitors related to information technology (Riege, 2005).

However, the human dimension has a high influence on information technology, since people are involved in the design and the use of information technology in organizations. Therefore, information technology can be better understood, managed, and changed only in a historical organizational-institutional context. Thomas (1994) explained that it is needed a different perspective to study technology. In his book, he suggested that technology should be evaluated by considering also the slight turns and twists of the politics and influences in organizations. *"First, the physical world does indeed constrain the range of alternative ways human beings can organize the production of social goods; and second, the social worlds (i.e. the organization and institutions) that human being create influence the way they understand and act on the physical world"* (Thomas, 1994, p.5) . Therefore, Thomas (1994) argued against the technological determinism, espousing the *power-process* perspective, which takes into account human behavior and politics toward technology.

#### *3.3.1.6 Inadequate Organizational Structures and Processes*

*Organizational structures and processes* concern the definition of the roles, responsibilities, hierarchy, authority, methods, and models in organizations. The organizational structures and processes have to be designed in a way that induces the flow of information, in accordance to needs and goals of the organizations.

One important factor that impacts the information flow in organizations is the definition of authority. Authority refers to the rights inherent in a managerial position to give orders and expect the orders to be obeyed. Authority is given to managers, so they can meet with their responsibilities. Therefore, in case of unit of command, a subordinate is supposed to obey and report to his or her manager (Fayol, 1949). By using authority, managers can decide about their subordinates' tasks and can request from the subordinates information that they need to make decisions. Therefore, employees are expected to share with their manager the information requested by him or her, due to the existing authority and power relationship (Robbins & Judge,

2007). Different leadership styles might affect the results of the organization and the group climate (Goleman, 2000).

Inadequate organizational structures and processes occur when organizational design does not fit the context in which the organization is immersed. Therefore, the assignment of tasks, processes, roles, responsibilities, methods, and authority do not induce flow of information. For instance, inappropriate hierarchical organizational structure inhibits or slows down sharing of information. Misallocation of human resource such as skilled staff can also impact negatively the flow of information (Riege, 2005).

#### *3.3.1.7 Lack of Time*

Time constrain is an inhibitor for information flow (KPMG, 2000; Riege, 2005). Lack of time can happen when employees are overworked, when they do not appropriately organize their activities, or when they are not able to delegate. Even though managers are aware of the benefits of information sharing, they often struggle to induce this process in the organization due to time restrictions and scarce resources (O'Dell & Grayson, 1998).

### 3.3.2 The Inhibitors for Information Flow are Intertwined

Even though the previous section discussed the inhibitors for information separately, these inhibitors are more often than not intertwined, which means that different combinations of them can be found in organizations. The following example illustrates the interaction of the different inhibitors of information flow.

> The common answer for the question: “do you trust your mother?” is “yes”. However, if the following question is made: “When you were a child, did you use to say to your mother all your tricks, such as when you skipped classes at school?” different answers may be given. Some people who had mothers who did not punish them would answer “yes”. On the other hand, people that had more severe mothers, who frequently punish them, would say “no”.

These different types of answers reveal that people have different approaches when sharing information with other person and depending on the situation, trust is not enough to guarantee the validity of the information. In this case, the *fear of punishment* of the sender of information causes information asymmetry, regardless the existing trust between the two parties. The power relation and the fear of punishment affect the degree of willingness to share. Therefore, in this example, you trust your mother and you have a bound with her, but you do not share all the information you

have with her. Trust and fear of punishment were intertwined, but fear of punishment had a superior weight in this situation.

It is possible to bring the mother´s example to organizational environments by making an analogy between the relationship of mother and child and the hierarchical relationship between managers and employees. On one side, manager depends on information from their subordinates to make decisions (Brass, 1984). On the other side, employees are aware that their manager expects from them useful information for decision making. Employees also know that they need to show good performance and achievements to remain in the organization. Because of that, employees try to shape the information in a way that it matches managers' expectations and needs, instead of reporting mistakes and misbehaviors (Riege, 2005).

# 4 Methodology

The aim of this study is to explore relevant inhibitors for information flow in global product portfolio management. To accomplish this goal, literature concerning product portfolio management, study of organizations, and information flow has been reviewed. A frame of references was elaborated to support the collection of empirical data and its analysis. This chapter details the considerations for data collection, data analysis, validity, and reliability of the study.

## 4.1 Data Collection

The complexity of the undertaken task requires exploring a form of social interaction in organizational settings, in particular information flow in portfolio management. A case study design has been chosen because it allows researching a phenomenon in its real-life context (Yin, 2003; Eisenhardt, 1989). In addition, field research is appropriate for this context-dependent social setting since, *"context and judgment are irreducibly central to understanding human action"* (Flyvbjerg, 2001, p.4). An interpretative perspective has been adopted in order to understand the subjective meaning of social action. Accordingly, a qualitative strategy has been followed to allow an emphasis in words rather than quantification in the collection and analysis of the data (Bryman & Bell, 2011).

This study started with the formulation of a general research question about inhibitors for information flow in product portfolio management. With this inquiry in mind, the study was organized into two sections: a pre-study and a main case study at company Alpha. During the pre-study, a literature review of product portfolio management, organizations, and information flow was prepared. Along with this activity, the identification of required data was articulated.

The pre-study was carried to investigate patterns of information flow in product portfolio management. Semi-structured interviews were used as the method to collect data in this pre-study. Five interviews were performed, which included a consultant specialized in project and portfolio management, three product portfolio managers from global companies leading in their industries and not in competition with Alpha, and a member of the portfolio management group from Alpha. These interviews permitted the researchers to find recurrent themes regarding information flow in product portfolio management. The emerging themes were used to shape the interview guide that was used in the main case study at Alpha. During this pre-study, the interview guide was tested, and the reaction of the interviewees to the different questions was also examined.

Alpha, the case study company, was selected with the aim of generating an exhaustive examination of a single case on the subject in question. In particular, the aim was to observe in detail the inhibitors of information flow in product portfolio management. The review of a single case allows the researchers to motivate further research questions, to identify circumstances where theory does not hold, and to sharpen theory by pointing and attempting to fill gaps (Siggelkow, 2007). In case studies the critical goal is not to obtain findings that can be generalized to a wider universe, but to attain findings that allow the generation of theory (Yin, 2003). The main data collection method was semi-structured interviews with key participants involved in global product portfolio management at Alpha. Initial respondents were suggested by the portfolio manager and then convenience sample and snowball sample were used. Both approaches are common in the field of business and management. Data collection was performed until data saturation was achieved, meaning that no new or relevant data seemed to emerge (Bryman & Bell, 2011).

A total of eleven semi-structured interviews with members of product portfolio management in Alpha were conducted by two researchers. The interviews were recorded with the permission of the interviewees, except for three interviews conducted over the phone. Interviews averaged approximately one hour in length. After each interview, notes and impressions were compared, and the interviews were transcribed. The interview guides were divided into three sections. The first section included questions about the position of the interviewee focusing on his or her role in product portfolio management. This set of questions aimed to understand the context and patterns of product portfolio management. The second set of questions was related to the information shared within the unit where the interviewee works. The third set of questions was the most extensive part of the interview guide. It included questions regarding information shared between the central product portfolio management and dispersed units worldwide of Alpha. In the study, the former is referred as the Product Portfolio Unit and the latter are referred as Regional Units.

The respondents were asked the same set of questions, except for few questions that regard specific aspects of the central Product Portfolio Unit or the Regional Units. An interview guide was followed, but the questions were not always asked in the same order. Some questions were designed exclusively to the Regional Units and others to the Product Portfolio Unit. Follow-up questions emerged during the interview with the aim of getting further insights of relevant matters. Respondents were free to elaborate on the subjects they found important. Questions about the inhibitors for information flow from an organic perspective were not asked directly, because it might not make sense for the respondents. Instead, the inhibitors for information flow from an organic perspective were identified through analysis of the context.

Permission was granted to observe three meetings (conference calls) between the central Product Portfolio Unit and the Regional Units of Alpha worldwide. The researchers' involvement was unobtrusive in character, which is also denominated non-participative or complete observer (Gold, 1958). In this methodology the observer is usually visible to the group, but without participating of the observed phenomenon. This data collection method is useful to get first hand data, to allow deep insight of the setting, and to remove the possible problem of reactivity of other participative methods. However, the risk of failing to understand the situation and make incorrect interferences is also present in this method (Bryman & Bell, 2011).

Secondary data from Alpha was collected as a complement to interviews and observations. Written documentation such as reports, templates, the company's web site, and annual reports were considered. In addition, the researchers reviewed previous academic studies carried at AlphaCorp in order to gain some context before performing the interviews.

## 4.2 Data Analysis

Inductive approaches allow the iterative process of matching theories with empirical data, which leads to creation of new theories based on the set of plausible evidences. This study followed an inductive approach to interpret collected data, which allows reinterpretation to motivate new questions and to produce new inferences out of the observation (Bryman & Bell, 2011).

The data was examined using narrative analysis, which is often used in business and management research due to its approach to the analysis of language. Advocates of narrative analysis argue that the benefits of this approach are its capability to explore human context, by allowing interviewees to reconstruct in their stories the connections between events and contexts. Narrative analysis is also an adequate approach to the study of how people make sense of organizational change, culture, power structure, meaning and identity (Rhodes & Brown, 2005; Bryman & Bell, 2011). Thus,

narrative analysis has been selected as a suitable approach to understand structures, viewpoints, and perspectives of organizational settings for this study. In addition, it stimulates reflection on the divergent interpretations of organizational life (Rhodes & Brown, 2005).

During the analysis, distinctions between respondents from different functions from the organization were rarely made, in order to guarantee anonymity of the interviewees. The results of the interviews were analyzed by observing the distortion between formal system and actual behavior in product portfolio management settings.

The results were organized in two main sections: 1) patterns of information flow in product portfolio management, and 2) the presence of relevant inhibitors for information flow. The inhibitors were regarded as relevant because they were useful to explain how people's behaviors can hinder information flow, and also because they were recurrent topics in the empirical data. Part of the results from the pre-study is used in the first section of the analysis, since the pre-study focus was in the patterns of information flow in product portfolio management decisions. Figure 6 summarizes the research design.

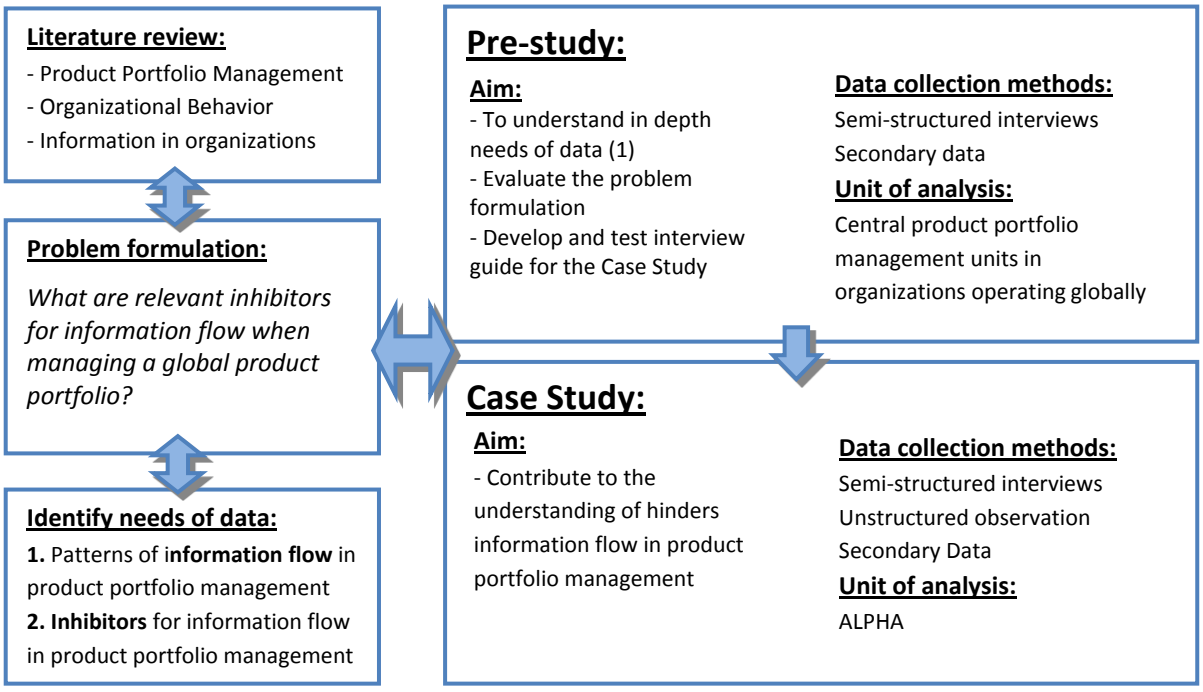


**Figure 6 Summary of the research design**

## 4.3 Validity and Reliability

In order to assure the quality of the results and the integrity of the conclusions of this work, different approaches to validity and reliability were considered when designing the study. Triangulation of the

information was achieved by reviewing internal documents, observing meetings, and reviewed other academic studies about the company under study. Triangulation was used to avoid misinterpretation of single sources of data and as an alternative to validation (Bryman & Bell, 2011; Yin, 2003).

A disadvantage of the case studies is the low external validity (Yin, 2003). However, this research provides a detailed case of information flow in product portfolio management using organizational behavior theory to analyze the results of the case. The case allowed the researchers to identify hinders of information flow using the distortion of formal system and actual behavior as frame of reference. The theory behind this model was supplemented by the results of the case to investigate gaps in theories concerning individuals' behavior. In this way this case study allows researchers to contribute to the clarification of the theory and the motivation of further research questions in the field (Siggelkow, 2007). The concepts defined in the frame of reference were used to analyze the empirical data. The observation of congruencies between concepts and empirical data is a strong point of qualitative research because researchers get in touch with the social context of the studied phenomenon. In this study, the internal validity was assured because it was matched the researchers' observations and the theoretical ideas developed in the frame of reference (Bryman & Bell, 2011).

Regarding reliability, in order to replicate the study, interviews were recorded and transcribed. The template of the semi-structured interviews is presented in Appendix 1. Additionally, detailed notes of the observation meetings were documented.

# 5 The Setting of the Study

This study was commissioned by Alpha and carried out in the global product portfolio management setting. AlphaCorp was founded in Sweden more than a hundred years ago. It serves a global market in a mature industry, and it is among the world's leader brands. An oversea group recently bought AlphaCorp, and the new owners took over in the beginning of 2012. The company is now the largest business of the group; moreover, efforts have been put on promoting a customer-oriented mindset among the employees.

AlphaCorp consists of three main business units: BU1, BU2 and BU3, see Figure 7. The BU1, (from now on referred as Alpha), design and produce machines for the engineering market, which are complementary of BU2 and BU3's products. The products from the business units can be sold

together with the products produced by Alpha or not. BU2 represents the largest part of the company's total revenues. This study was carried out in the business unit Alpha.

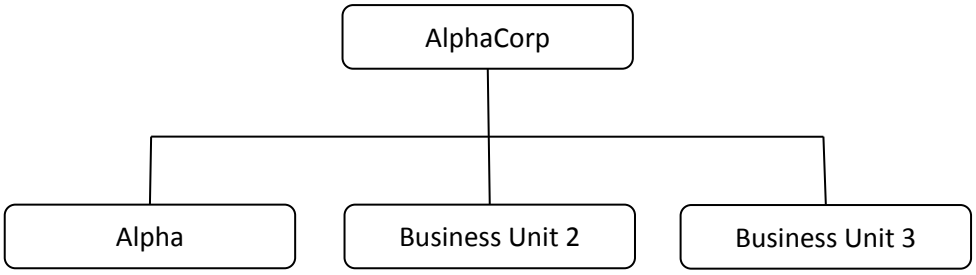


**Figure 7 AlphaCorp's businesses units**

AlphaCorp has a strong brand name, and used to be recognized for their technological edge. However, Alpha has fallen behind the competitors, and it is now seen as a follower in the market.

## 5.1 Description of Alpha

In the past, Alpha had three decentralized R&D departments spread out worldwide, and the product portfolio was managed regionally. This decentralized organization had a time to market shorter than nowadays. The freedom that the subsidiaries had to introduce new products in the market brought high variety of products with low margins. Moreover, the product portfolio had duplicates of the same products, which might create additional costs for the organization.

Two years ago, Alpha was restructured to have a central organization. One global product portfolio management unit (now referred in this study as "Portfolio Management Unit") was created and one global R&D unit. The restructuration aimed to gain more control over the product portfolio, to reduce the wide variety of products in the portfolio, and to benefit from economies of scales by developing new global platforms.

Due to the recent acquisition (beginning of 2012), Alpha has been in a new restructuring process. The new owners have been driving the company to promote a stronger customer-oriented mindset. However, employees have shown uncertainties about the future structure of the organization due to many changes that have been taking place in the last months. These uncertainties were identified in the interviews, when respondents emphasized their doubts with sentences like *"it does not work like this, at least up to now."*

## 5.2 The Global Product Portfolio Management Group

The Global Product Portfolio Management Group at Alpha includes all the functions and roles involved in the definition of the global product portfolio, from a market perspective. This group

includes functions that have direct contact with customers, such as the sales organizations worldwide, and also centralized functions that aggregate the market information and make the decisions about the global product portfolio.

In a simplified view, the Global Product Portfolio Management Group at Alpha includes the Portfolio Management Units and Regional Sales functions. The Portfolio Management Unit is the centralized organization in charge of the decisions about the global product portfolio. The Regional Sales is part of a Regional Unit. Alpha divides the market into nine several Regional Units, which are Europe, North America, South America, South Africa, Middle East, China, India, Asia Pacific, and Russia. The Table 1 presents a description of the main roles involved in the Global Product Portfolio Management Group.

**Table 1: Simplified description of the roles related to the Global Product Portfolio Management Group at Alpha**

| Units | Roles | Description |
|---|---|---|
| Portfolio Management Unit | Portfolio Management Director | The person in charge of the global product portfolio. This position reports to a Manager Director of the central organization. |
| | Support Team of Portfolio Management | The team that supports the decisions about the global product portfolio. This team reports to the Portfolio Management Director. |
| Regional Unit | Regional Product Managers | They are the interface between the regional sales and the Portfolio Management Unit. They aggregate the information from one specific region to report to the Portfolio Management Unit. Hierarchically, Regional Product Managers report dotted line to the Portfolio Management Unit and directly to the Regional Sales Director. |
| | Head of the Region | The person in charge of the Regional Unit. This person has full ownership and responsibility over the Regional Unit. |
| | Regional Sales Director | The person in charge of sales in Regional Units. |

The Figure 8 presents a simplified model of the information chain in the setting of the study. The focus of this work is on the information flow within the Global Product Portfolio Management Group, which is inside the dotted square in the Figure 8.

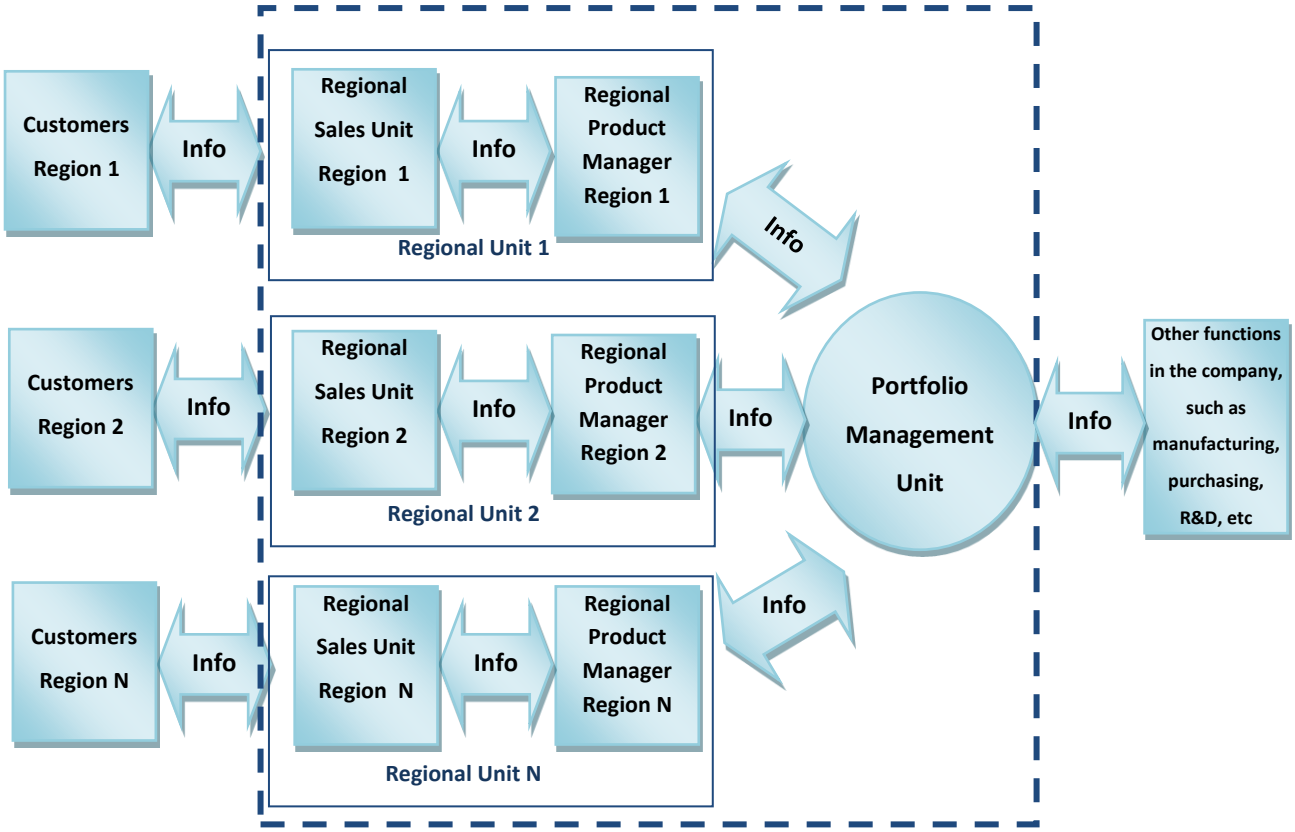


**Figure 8: Simplified model of information flow in Global Product Portfolio Management Group**

The Figure 9 shows a simplified organizational chart of the Portfolio Management Unit and some functions/roles that the Portfolio Management Unit interacts with. Other nodes, which were either related to Business Units 2 and Business Unit 3, or with functions that will not be studied in this work, were removed to simplify the model. However, it is important to highlight that the Heads of the Regions are responsible for operating the three businesses of AlphaCorp.

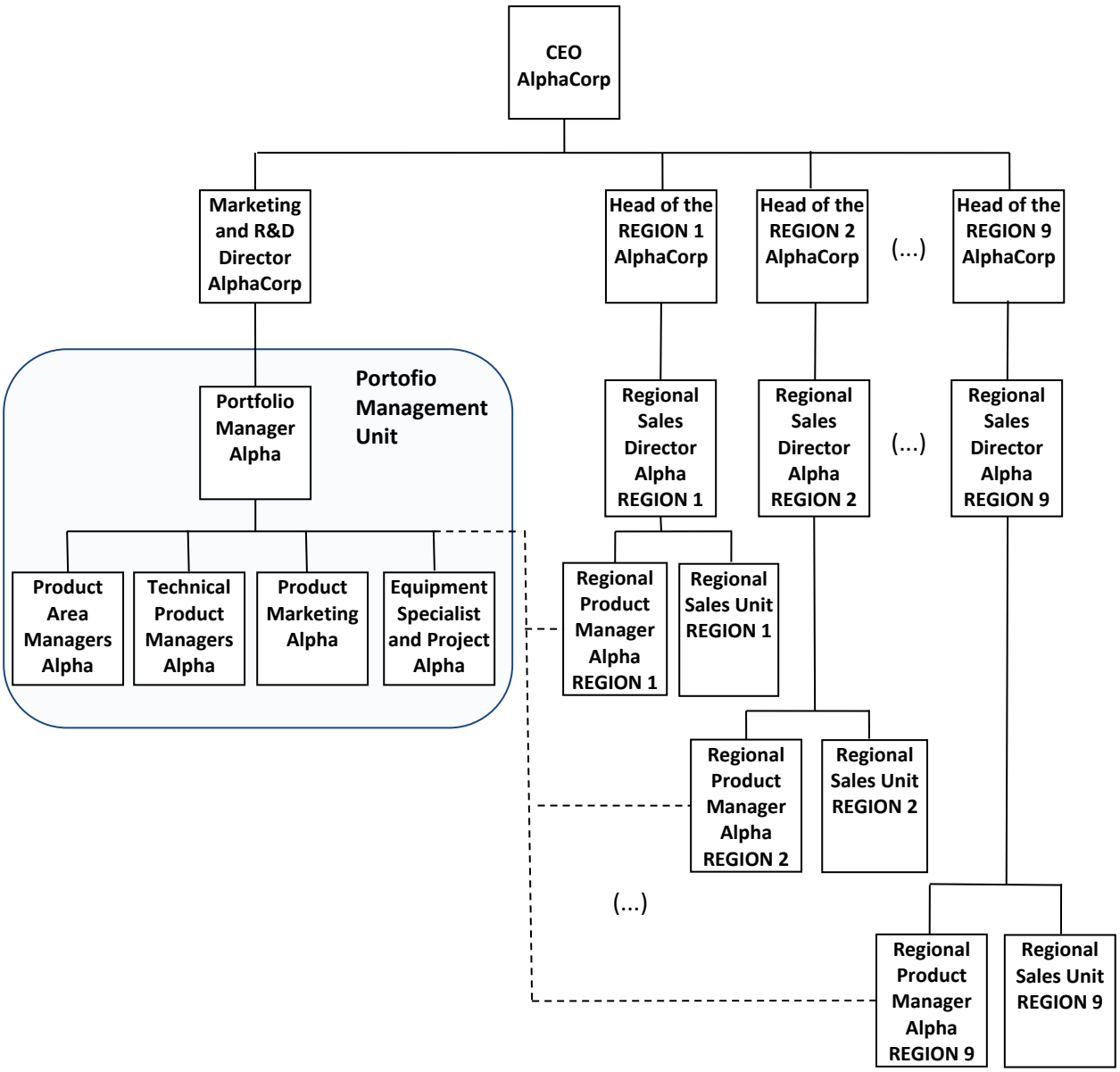


**Figure 9 Organizational chart - Portfolio Management Unit and related functions/roles**

### 5.2.1 The Portfolio Management Unit

The current main goals of the Portfolio Management Unit are: cost reduction, rationalization of the portfolio, and boost of sales. In order to achieve these goals, one important activity that the product portfolio unit has to execute is to understand the demands of products from the different regions/subsidiaries, to aggregate this information, and to analyze it in a global perspective. This aggregated information, together with information from other departments such as purchasing, R&D, and manufacturing, form the basis for decisions about the global product portfolio. Common decisions that the Portfolio Management Unit has to make are related to the prioritization of new products to be developed, the introduction of new products in the market, facelifts, and phasing out

existing products. In summary, the Portfolio Management Unit is involved in all decisions related to the products' lifecycle.

As showed in the Figure 8, in order to get information to understand the customers' demands from the regions, the *Portfolio Management Unit* interacts with *Regional Product Managers*, who are placed in the different Regional Units where Alpha has presence. The Regional Product Managers are the interface between the Regional Sales and the Portfolio Management Unit. There is one Regional Product Manager for each of the following regions/countries: US, South America, Europe, South Africa, Middle East, China, India, Russia and Asia Pacific. Even though the main contacts from the regions are the Regional Product Managers, the Portfolio Management Unit has an extended list of contacts for some of the regions.

In the Portfolio Management Unit, there are employees with different backgrounds such as market, business, and technical. The unit is currently running three projects for the development of new lines of products. The priority projects are the ones with high volume sales estimates and basic technology. This prioritization follows the strategy defined by top management. Top management believe that running this strategy will allow Alpha to first, catch up with the competitors, and then surpass the competitors.

### 5.2.2 Regional Sales

Alpha shares its sales force with the other businesses units of AlphaCorp (BU2 and BU3). These three businesses sell their products through distributors and direct sales. When it is possible, sellers are required to try to integrate their offers with all the products of AlphaCorp. However, sellers can also offer the products separately.

Alpha acquires a great amount of their market information from the Regional Sales. The role of the sellers is crucial as they have to perceive and understand the customers' demands and requests, and report the useful information to the Regional Product Manager. The Regional Product Managers filter, aggregate these demands from the Regional Sales, and report the information to the Portfolio Management Unit. This input, which is sent by the Regional Product Managers, is part of the basis for decision making in Global Product Portfolio Management.

## 5.3 Product Development Process

Alpha has in place a standard product development process. This process is divided in stages separated by decision points; at each decision point progress of the product development is evaluated by a steering committee. It is in the early stages of the product development process

when the business cases of potential products are prepared. The business case relies on the information provided by the Regional Units, which includes information about price, volume and market context. During these investigation phases the market product specification is generated. Based on this document, the product requirement specification is written, with the aim of translating the business requirements to product designs. Once the project enters the development stages, it is costly to include modifications or alter the approved design. The final stages are related to product test, production, and product follow up.

In order to gather more insights about the company, earlier master theses about Alpha were studied. In particular, a master thesis that studied user involvement in Alpha Corp was reviewed. The purpose of that work was to investigate how prepared Alpha was for user involvement in the Fuzzy Front End (FFE). The authors evaluated Alpha's FFE management as well as its innovative climate. They provided a theoretical framework that describe how Alpha can improve its innovative climate and manage its FFE more proficiently. They conclude that in order for user involvement to be successful, an innovative culture is needed and a proficient FFE management should be implemented (Bosson & Nilsson, 2011).

# 6 Data Analysis and Results

The analysis of the collected data aims to answer the question "***What are relevant inhibitors for information flow when managing global product portfolio?"***

Members of Alpha were requested to describe what the main activities in product portfolio management are. It was also requested answers about the situations that they face when working in this setting, and their close network, in order to identify how the information is shared in the organization. The data was carefully examined to identify relevant inhibitors for information flow when managing global product portfolios. In particular, aspects related to the expected and actual behaviors in this setting emerged during the interviews. The empirical data was sorted into two broad categories: the *patterns of information flow* in product portfolio management, and the *inhibitors* for information flow in product portfolio management.

The structure was originated while analyzing the empirical data. Distinction or clear boundaries within the categories are not perfectly delineated. Alternative structures are possible since the subjects are not isolated from each other. The analysis of each category will be presented in detail in the following sections.

## 6.1 Patterns of Information Flow in Product Portfolio Management

Product portfolio management is a decision process regarding the evaluation, selection and prioritization of products. This process is characterized by uncertainty, changing information, multiple goals and strategic considerations, and multiple decision makers and locations (Cooper et al., 2001, p.362). In order to understand the patterns of information flow in product portfolio management, respondents were asked to describe: 1) the kind of information required to make decisions related to product portfolio, 2) their involvement in product portfolio activities, and 3) their perceptions of the general goals of portfolio management. A summary of the patterns regarding information flow in global portfolio management is provided in this section.

First of all, it is worth to notice that in accordance to the literature, portfolio management main tasks identified by respondents were evaluation, selection and prioritization of product developments. These tasks were recognized as highly reliant on information from the different markets. "*Alpha is a company that listens to the client (…) we go on the market and detect opportunities for improvement, or for a different machine (…) we sent information regarding resources, technical specifications, costs, price, our competitors, and competitors' actions to the global team. Then they put the demands from different regions together, and make a reverse proposal to the regions*."

Voice of the customer was a recurrent concern among respondents. Most of them recognized the importance of being close to the customer, but they also recognized that it is needed to be cautious when listening to customers. *"That is really really important to listen to the market. And I don't say that voice of the customer is 100% right because is not."* During the pre-study portfolio managers also mentioned this issue "*if you want to work with long term, you have to listen to customers but they are pretty short sighted (…) Trends I think are the important thing. To extrapolate a little bit beyond the customers' input.*"

Besides evaluating new opportunities, monitoring the results of the current product portfolio is part of the activities of the Portfolio Management Unit according to respondents from Alpha.

"W*e are of course daily checking and working with today's business. That we have good modules and products and that we are selling them good enough. And we are working in technical changes of the existing products. It could be quality issues or face lifts or whatever. We are also working with rationalization. We are actively reducing part numbers that are not working well or not selling good.*"

These observations are related to after-sales activities such as tracking product results, customer experience and satisfaction. This kind of input from the customer is necessary for future decisions about the permanence of products in the portfolio (Kahn et al., 2005).

Product portfolio management also involves the coordination of several functional areas in organizations (Cooper et al., 2001). The involvement of stakeholders from different functions was mentioned by several respondents. "*We need to have the whole organization in line with the objectives (…) we have other parties around here that need to have the same view. Of course we can't be 100% in line but we really should be focusing on the same thing to make things happen and that is a big job.*"

Environmental uncertainty and issues about the reliability of the information used for decision making in the early stages of portfolio management was recognized by respondents "*it is difficult to say we will sell 1000 or 500 or 2000, if it is a new product and you have nothing to relate to."* This is in line with authors like Verganti (1999), whose research showed that during the early stages of new product development uncertainty is the highest.

Despite of the acknowledgment of uncertainty, reliable information to evaluate projects was denoted by respondents as a critical factor for decision making in product portfolio management "*it is important for me that the regions are objective when they pick out information and give it to me. So I get the right information.*" Or as other respondent from Alpha explained *"[Region Units] can give us good inputs from their experience in the market. But they should do it in a structured way; it should be quite detailed and structured."* Similarly in the pre-study, product portfolio managers referred to the importance of data accuracy when evaluating requirements for product adjustments or new product development from sales people "*we have to avoid at maximum emotion, and to be fact based. Because fact base is reality, emotion is more dream.*"

In summary, patterns of information flow in product portfolio management are related to the different products' requests from the sales units (e.g. new products, new features and enhancements), forecast or estimates about the potential of new product development, the voice of the customer, analysis of competitors, and the actual performance of the current products in the portfolio. In general, information sharing between sales and the portfolio management unit was perceived by most respondents as highly important for decision making in product portfolio management. But at the same time, it was recognized by respondents that information is scarce and interpretation of the information is necessary when making decisions "*You know which numbers you*

*can trust and which you cannot trust (…) you know what is behind the request (…) you can easily take some information for granted that is totally wrong. It can bring you to a situation.*"

The following sections will present the inhibitors for information flow in product portfolio management. In the analysis of the inhibitors, it will be emphasized that the flow of required information for decision making is guided by the processes formally established in the organization (blueprints, structures, process, information systems, business cases, meetings, templates etc.), but it is the actual behavior of the members of the organization that ultimately shape the results of the organization (Homans, 1950; Shani & Lau, 2009).

## 6.2 Inhibitors for Information Flow in Global Product Portfolio Management

Studying information flow requires the understanding of the sender and the receiver, the message, and the channel used to share information (Robbins & Judge, 2007). It is useful to recognize the available channels or mechanisms that facilitate the flow of information among organization members, but it is probably more important to understand the motivations of the people who share the information. Thus, information flow is seen as the result of people's perceptions and motivations to communicate. It is people who decide about what information to share and how, and they act according to their own interests, goals and motivation (Ferris et al., 1989; Maslow, 1970). In this section of the analysis the different inhibitors identified in the empirical data will be contrasted with theories present in the literature. The identified inhibitors were *conflicting goals*, *fear of punishment*, *lack of trust*, *geographic distance and language barrier, lack of proper information technologies, inadequate organizational structures,* and *lack of time.*

### 6.2.1 Conflicting Goals

Conflicting goals were identified in the literature as an important inhibitor for information flow in organizations. Senders and receivers of information selectively see and hear information according to their needs, motivations, experience, background and personal interests. In product portfolio management, the individuals' goals impact the information flow since it affects the willingness to share between members of the organization. The evaluation process of new product development and the decisions related to new project prioritization at Alpha will be used to analyze the implications of conflicting goals in information flow.

#### *6.2.1.1 Conflicting Goals in the Evaluation of New Product Development*

An important aspect when evaluating the inclusion of products in a company's portfolio is the estimation of potential sales, market size, and financial targets for existing and new products

(Cooper et al., 1999; Ronkainen, 1985). To put together these estimates, it is required to combine criteria and input of different groups inside and outside the organization. Since different groups are involved in the estimation process, it is likely that *conflicting goals* emerge and affect the reliability of the estimates. At best scenario, individuals' own goals and the organization's goals will be aligned, while in the worst, individuals have the purpose of only fulfilling their own goals at the expense of the organization's goal (Ferris et al., 1989).

In the case of Alpha, the Portfolio Management Unit is in charge to put together the estimates to create the business cases of new product development. Alpha uses gross margin as one of the drivers to evaluate new development, which is calculated taking into account expected revenues, benefits gained from the product, and the expected costs. The financial analysis is complemented with strategy analysis about market size and segmentation, product positioning, value proposition, and analysis of competitors (Internal Documents Alpha, 2012).

The required information to include in the calculation of forecasted gross margins and details of the business cases are provided to the Portfolio Management Unit by the Regional Units. Regional Units are in charge of providing these estimates, because of their proximity with the customer and knowledge of their markets. Respondents at Alpha explained that the quantitative estimates are not the main thing when creating the business cases; it is the analysis and explanations of the numbers that contribute to product portfolio decision making. "*The finance department reports just the numbers. We give words about the numbers. About competitors, justify the numbers with information on the market*."

At Alpha, different attitudes toward estimates emerge according to the goals of the Regional Units. For instance, some respondents reported underestimation of sales volumes to avoid problems in the case the estimated sales targets are not achieved in the future *"volume estimates don't inform the full potential."* Other respondents recognize an opposite attitude, in which sales volumes estimation were overoptimistic to influence the prioritization of projects *"they say that they can sell thousands, just to push the start of a project. But then in the end (…) they just can sell half of the volume."*

A different attitude when providing estimates includes conflict avoidance. *"[About sales estimates] first a draft is done, but at the end top management decides the numbers. It is a game between what it can be sold and what the company needs to achieve goals of growth."* Total conflict avoidance can be detrimental to information flow in organizations. When employees face conflicts, they tend to share information about their preferences, about why they have preferences, and then search out new solutions which satisfy the criteria of as many people as possible (Galbraith, 1973).

Acknowledgement of the different attitudes toward estimates influences the perception and the interpretation of those estimates. Perceptions range from complete disbelieve in the estimates to understanding and confidence in the numbers. "*They don't believe on us and we don't believe on them.*" On the other hand, "*It is very hard to say is black or white (…) open mind, not blaming each other. Trying to be having the same agenda, the same view for the future is important."*

People perceptions and motivations influence information share. People behave in a way that maximize their short-term and/or long-term goals, which can be either consistent with the organization´ interests or not (Ferris et al., 1989; Buchanan & Badham, 1999a). In line with the theory, the product requirements, volume forecasts, price estimates, and market analysis in Alpha are subject to the different interests and motivations of the people providing the information. At the same time, the receiver of the product forecasts and estimates will interpret and make use of the estimates in different ways.

#### *6.2.1.2 Conflicting Goals in the Prioritization of New Product Development*

*Balancing of short term and long term* goals is one of the main challenges in product portfolio management. Allocating resources in future oriented projects, when urgent profitable tasks are also in desperate need of those resources is a constant dilemma (McGrath & MacMillan, 2000).

Alpha Portfolio Management Unit is undertaking a major task, which includes a complete transformation of the company's product portfolio. The main goal of this transformation is to remove complexity of the portfolio. It is also about achieving economies of scale which will benefit the company in terms of purchasing power, R&D and manufacturing costs reduction. In the short term, the goal is to remove from the portfolio products with low sales. In the long term, the goal is to design completely new platforms of global products that allow the company to benefit from high volumes and catch up with the latest technology.

Regarding future platform prioritization, the focus at the beginning will be in the development of machines with high sales volumes, low cost, and basic technology. *"If we want to survive here, we need the volume that is how we can compete with Asia and so on."* According to this strategy, the Portfolio Management Unit will concentrate first in the development of the basic platform and later the development of the high-tech platforms. The order in which the platforms are scheduled to be developed benefits the Regional Units where low cost machines are the main portion of the sales. At the same time, it is a disadvantage for Regional Units in which high end products constitutes the main part of the sales.

Conflicting goals emerged from the prioritization of new platform developments at Alpha. Some Regional Units perceive that their goals are blocked "*I don't believe that there is such a thing as a global product portfolio. And none of our successful competitors have it. It is very much regionalized product portfolio."* Conflicting goals can lead to each party trying to defend their point of view and interests, which might result in resistance to change (Szulanski, 1996), interdivisional jealousy (Szulanski, 1996), turf protection (Davenport et al., 2001), lack of cooperation (Grant, 1996), lack of commitment (Polanyi, 1966), and lack of motivation (Davenport et al., 2001). In the following paragraphs respondents' quotes are used to evidence some of these issues.

There were some comments about the difficulties to align Regional Units with a global portfolio strategy *"[Region 1] is not very interesting in what [Region 2] needs, and [Region 3] is not very interested in what [Region 2] needs, so they are happy with their own region. (…) but now we need to make them change their mind set, because now we need to think global."*

The Regional Units that are disfavored by the prioritization of the platforms seem to be feeling that their points of view are neglected.

*"It is an issue giving input [estimates] at the beginning, and then not giving other input as the product matures during the project (…) sometimes we have a month, two months, without knowing anything (…) And we really don't seem to hear again, until we are (…) weeks away from the products being ready for production. And then it is too late to change anything in the platform."*

Respondents recognized the importance of including the Regional Units in the process of prioritization and strategy formulation; otherwise it was recognized as difficult to gain commitment from Regional Units.

*"It is really important to give feedback to the regions, and explain why the roadmap is looking as it does. For example now we are giving priority to Platform X and when we tell them we will wait for Platform Y. Regions say: ' what are you doing, we don't care about these products, (…) we don't like them'. (…) Regions are not very interested in this. But we need to explain that this is what we need to survive (…) so by explaining the figures and the reasoning behind the figures, they are understanding ok (…) they also know that is plus and minus. That is what is all about, communication is key."*

Cooperation between the different functional areas is essential to product portfolio management. Conflicting goals of the sales organization and the product portfolio management seems to be inevitable. It is difficult for portfolio managers to apply their strategy if the sales organization does not cooperate with it (Archer & Ghasemzadeh, 1996; Cooper et al., 2001). In the case of Alpha's

Global Product Portfolio Management, the Portfolio Management Unit does not have direct authority over the Regional Units. Therefore, most of the work and tasks done in this setting depends on cooperation among the Regional Units and the Portfolio Management Unit. *"[The Portfolio Management] don't have the authority to tell them to do that."* Research identified that when it comes to tasks in which parties share similar goals; cooperation is more easily achieved (Buchanan & Badham, 1999a).

Since conflicting goals between the Regional Units and the Portfolio Management Unit are present at Alpha, examples of lack of cooperation between these two parties were identified. For instance, refusal from the Regional Units to prepare reports with necessary information for the Portfolio Management Unit, or resistance to offer resources for testing new products in the Regional Units. *"We have two jobs here: to convince the Alpha people, and also the customers."*

Reliable information is expected from the Regional Units. However, the actual behavior is that the Regional Units send biased information due to self-interest and to protect the sales of their regions (Homans, 1950). The divergences of views have implications in the information that is exchanged in Global Product Portfolio Management at Alpha, since each party may try to defend their points of views (Buchanan & Badham, 1999a). As mentioned earlier, conflicting goals in organizations can result in distortion between formal system and actual behavior. This distortion is product of resistance to change, jealousy, and frustration, lack of cooperation and commitment, which in turn affects the information flow in organizations.

### 6.2.2 Fear of Punishment

*Fear of punishment* is a hinder for information flow (Riege, 2005). Fear of punishment may prevent that individual shares mistakes with the others, in case that the individual perceives possibilities of getting punished due to the mistakes. This situation is likely to happen in organization where one member has authority over the other, where there is power relationship, or high level of control is perceived by the sender of the information (Robbins & Judge, 2007).

At the moment of the study, the Product Portfolio Unit had not formal authority over the Regional Units. However, it was identified a situation where information flow was hindered due to the high control, and risk of punishment perceived by the Regional Units. This situation and its context are further explained below. Concepts related to conflicts goals and self-interests are also presented in this section in order to elucidate the situation.

In line with the literature that says that sales organization and the product portfolio management has sometimes conflicting goals (Cooper et al., 2001), some respondents presented diverged views regarding the rationalization project carried at Alpha. The rationalization project is an initiative from the Portfolio Management Unit, to reduce the number of part numbers and products in the global product portfolio. Some respondents argued in favor of this project, saying that the current product portfolio is too wide and it has been too costly to manage the excessive amount of part numbers "*it is to make sure that we are cost efficient and performance efficient. Because there is no need to have a wide range, you can reduce down to a narrower range."* The rationalization project depends on information from Regional Units to define, among other things, which products will be eliminated from the global product portfolio.

There are different interests regarding the elimination of products in the portfolio, and each party involved is trying to argue in favor of their own beliefs. This leads to conflicts in the rationalization project. One respondent that support this project mentioned about the performance of others: "*They don't know, or they don't fell how costly is to manage a lot of part numbers with very low sales each."* Systems do not always work as the way they are supposed to work in organizations and even though the rationalization is part of the formal system, some people have shown resistance in changing the product portfolio (Homans, 1950; Szulanski, 1996; Buchanan & Badham, 1999a).

As a result, respondents identified a situation that can go in an opposite direction of the rationalization project by making the portfolio even wider. Respondents said that some features might be added locally in the products without control from the Product Portfolio Unit. *"[About an added feature] we see that it is something new that we haven't seen."* And the respondents also revealed that it is not in accordance to the required behavior *"It may be some [people] trying to do something, but it is not as it should be."* Therefore, it was identified that might be due *to fear of punishment or consequences that* people do not report to the Portfolio Management Unit the features added in products locally.

When asked about the level of autonomy that people have to add features in products, respondents agreed that changes in products should be done centrally. "*They are not free at all. They cannot change any technical data, or whatever. That is done centrally."* Hence, the fear of reporting the adding of features locally may occurs because people who make this modifications in the products see a high level of control from the Product Management Unit, therefore their intrinsic motivation for sharing information is reduced (Osterloh & Frey, 2000).

The slower response from the central organization to market and customers' demands can be seen as a reason why features in products have been added locally by the Regional Units. Most of the respondents recognized that the creation of the global R&D and the Portfolio Management Unit lead to slower response from the central organization side to market' needs. "*For a moment we will suffer for not having as much speed* [time to market] *as we had in the past." "We lost the flexibility to meet the demands of regional market that the sub regions' needs."*

According to one respondent, since there is low speed response by the global R&D and the Portfolio Management Unit, some urgent activities are done locally, but there is a need of a centralized control, which has been not happening so far.

*"We have our products, and there are some customers that say that I would like the* [feature] *in this side instead. (…) and there are local people that are fixing that with a local service station. Of course it is probably not possible to have that blocked 100%. But especially when you have big demanding customers, this should not be done like that. (…) if you have a problem latter with that customer, then you have a big problem, and we are not aware. (…) The best thing is to have the global activity, but you should be able to have a local activity but it should be stared from the central. If the central cannot manage in certain time frame, then the regions can manage themselves, but it is under central responsibility. This is lacking today. So there is room for improvements."*

Another analysis about this situation is presented. According to organizational behavior theory, adding features in products is an actual behavior observed, while rationalizing the portfolio is the formal system established by the organization (Homans, 1950). The rationalization project (formal system) relates to the behavior imposed on the Regional Units by the Product Management Unit. However, the emergent behavior of the Region Units (actual behavior) is the adding of features in products locally without formal control of the central organization. In this case, the Regional Units partially ignore requests from the Product Management Unit to reduce the variants in the product portfolio. Due to fear of consequences these changes are not reported. However, it is difficult to assess that adding features locally has positive or negative effects on the overall good of Alpha.

### 6.2.3 Lack of Trust

Throughout the analysis of the empirical data, trust was also identified as an inhibitor for information flow at Alpha. The fact that the Portfolio Management Unit was recently created may have a negative impact on the creation of trust among members of the Global Product Portfolio Management. Trust relies on the predictability of interactions that occurs over time (Robbins & Judge, 2007); therefore time is needed for the development of trust. However, this time issue is still

subjective since it is not possible to define the time needed to create trust between organizational members.

In information flow, the lack of trust on the receiver leads senders to be more guarded in their communication (Davenport & Harris, 2007; Davenport et al., 2001). Moreover, lack of trust on the validity of the information implies ineffective information flow, because the information is not a reliable source for decision makers (Riege, 2005). Both cases where identified at Alpha.

The analysis of the lack of trust as an inhibitor for information flow at Alpha will be explained in the next sections, which is divided in three parts. First, it will be presented the lack of trust on the Regional Unit's requests. Second, it will be explained the lack of trust on the validity of the estimates that Regional Units send to the central Product Portfolio Unit. Third, the lack of trust on the how the Product Portfolio Unit (the receiver of information) will use the information will be described.

#### *6.2.3.1 Lack of Trust on the Regional Units' Requests*

Development of new products is a way that the Global Product Portfolio Management Group follows to update the mix of products offered to customers (Cooper et al., 2001). As already mentioned, decisions related to the prioritization of new products development involve several actors, and different interests. Even though the Product Portfolio Unit depends on the requests from the Regional Units to decide about the new products to be developed, lack of trust on the information received by the Regional Units was prevalent among the respondents.

Respondents mentioned that requests and information provided by Regional Units have to be filtered by the Product Portfolio Unit, because these requests not always are in accordance to the global strategy. "*And it is up to us here in the global team to filter this because some features they are asking for are very regional."*

According to the respondents, filtering the information is needed because sometimes Alpha's employees tend to act in order to fulfill few main customers' expectations, which can lead to biased requests. Respondents mentioned that it happens because Alpha used to have a very local presence and close contacts with big customers. "*And they really are good friends of the big customers. They want to fulfill their expectations and needs, (…) it is more like based on friendship (…) and then you hear that the feature is really important, but in the end it is only for one customer. Even if they are buying quite many products, volumes, we cannot reflect only one customer voice."*

Thus, Portfolio Management Unit does not completely trust on the information received from the Regional Units. Therefore, the Portfolio Management Unit has to strive to understand in depth the

demands for products or features, in order to avoid the development of new product or feature that please only few customers that do not represent a wider target market. As a result of this analysis, some requests from the regions are fulfilled by the Portfolio Management Unit, and some requests are not.

Accordingly, respondents from the Regional Units reported that their expertise and information have been neglected in the early phases of the process, when prioritization and products' features are defined "*we have expertise (…), but we are not involved early enough in the process. We feed in the original volumes and very very very brief market information. But we actually don't participate in the business proposition."*

In the example just mentioned, the formal system establishes that the Portfolio Management Unit is supposed to acquire and consolidate information from the Regional Units as part of the aims and tasks of this unit. However, the actual behavior observed is that the Portfolio Management Unit dismissed the market information and expertise from the Regional Units. The reasons for the distortion between formal system and actual behavior can be explained by the lack of trust on the requests and information sent from the Regional Units (Riege, 2005).

#### *6.2.3.2 Lack of Trust on the Validity of the Estimates*

In general, it was identified lack of trust on the estimates sent by the Regional Units to the Portfolio Management Unit. Respondents reported that the estimates are inaccurate "*a deviation is ok, but how big deviation.*" They explained that product requests, including volume and price estimates, usually do not seem to display the reality of the market. "*There are all sorts of product's needs, but you must understand the voice of the customer, what is truly needed. Not the needs of few customers of few sales reps.*"

As explained by respondents, justifications for deviance between the actual sales and the estimates are plentiful. "*What is the main driver of a sales rep? Meeting his numbers, meeting his budget. If he is not meeting his number, his main reflection is: 'Of course I don't have the products. If I only had those products, I would have sold the products and I would have met my budget.' So they go to headquarters and say you don't really understand what I need."*

The lack of trust on the estimates leaded to the implementation of new guidelines in the way estimates should be provided by the Regional Units. The Regional Units are now required to sign-off the estimates sent to the Product Portfolio Unit. The idea of the Portfolio Management Unit was to look for commitment of the Regional Units with the estimates that they were providing for product

development. Commitment has proved to be an important mechanism in achieving portfolio management goals. It is difficult for portfolio managers to apply their strategy if the sales organization does not cooperate with it. At the same time, decision making about product portfolio is a daunting task due to the uncertainty surrounding the process, diverse goals and agendas, and the multiple stakeholders and locations (Archer & Ghasemzadeh, 1996; Cooper et al., 2001).

In order to promote commitment with the estimates that Regional Units send to the Portfolio Management Unit at Alpha, the sign-off of the estimates was implemented. In other words, Regional Units have to sign the estimates (volume, price or market information) that they send as input for the business cases. *"[About the sign-off of the estimates] this is not to validate if the information is right or not, it is just to have commitment from them*." A similar impression about the sign-off was that *"there is a need for these regions to fully come on board and sign-off what they are able to deliver."*

The respondents from the Portfolio Management Unit have reported some troubles to get the sign-offs from the Regional Units: "*I understand that they are very anxious now, the regions. And not happy about signing and now all of a sudden when we call them no answer, if we email them: can you confirm this, silence."* Another respondent about the signature issue: "*it is also tricky when it comes to getting commitment. (…) Can you just confirm this is what you said last month? Can you just reply my email saying you confirm that? And I am not sure why, but little bit scare to do that. I don't see the why actually. Just say yes. Some say, for sure I stand by that sure, some of them get a little bit nervous."*

Respondents recognize to some extent the situation that the signature process has created different responses among Regional Units: *"they are very anxious now ", "little bit scare", "bit nervous", or "sure I stand by that."* Respondents also perceived that this kind of mechanisms will lead to different issues. For instance, problems can emerge if original requirements are changed during the product development process, and business case turn to be not valid anymore. "*We are pushing regions to sign-off, and ask them for their feedback along the way, then we need to be prepared to have an answer that we don't like. So far no one has said we will stop. I don't know what will happen. Because half the way of a project is a lot of cost."*

Summarizing, the lack of trust on the estimates is a hinder for information flow (Riege, 2005), which leaded Alpha to the implementation of a formal mechanism for increasing control about the figures sent by the Regional Units. Control is sought by means of the signature request when providing estimates. It is important to notice, that formal mechanisms like the request of the signature

triggered different responses and behaviors among the senders of information. Thus, the mechanism implemented to deal with the lack of trust on the estimates affects the behavior of the senders and the estimates sent. This in turn might create new trust issues on the estimates and distortion between formal system and actual behavior.

#### *6.2.3.3 Lack of Trust on How the Receiver will Use the Information*

Lack of trust concerned about how others will use shared information is appointed as an inhibitor for information, since people become less available to share (Davenport & Prusak, 1998; Davenport et al., 2001) . In the case of Global Product Portfolio Management at Alpha, some employees undermine the importance to share information demanded. There was one situation in which some members neglected to create a report with useful information to other members of the Global Product Portfolio Management. This situation exemplified lack of trust from the senders' side that the information is useful for the receivers. This lack of trust had a negative impact on the information flow, since the receiver did not accessed the information desired.

Senders are more prone to share information if they see that it is useful for the receivers (Riege, 2005). At Alpha, respondents said that people are more likely to share information when they see that information that they had shared in previous occasions produced positive results. *"What we are trying to do now is really listen, trying to do something and (…) coming back to them and say: 'here are the products, or here are the solutions' (…) Then, we will be trustable. Right now I think they trust our intentions, that we are really serious, and want to do something, but until we had not delivered, you haven't improved anything."*

This situation illustrates that when people do not trust on how the information about market or estimated will be used, they will be less prone to share (Davenport & Prusak, 1998; Davenport et al., 2001).

### 6.2.4 Geographic Distance and Language Barriers

A characteristic of the Global Product Portfolio Management organizations is that the geographic distance causes problems in information flow. Most of the respondents agree that meeting people in person has a great value for the process of information exchange. "*Time to time is good to meet people in person.*" Therefore, the respondents consider that do not knowing the person is a drawback when exchanging information*"(…) some of the people I have met, but not all of them. And that is difficult. It is easier if you have a face, if you have met the person. So for sure I need to meet all people in (…) and the people that I talk frequently, because it makes the dialogue easier."*

Communication is very important for the information flow in Global Product Portfolio Management. Some troubles related to language barriers were mentioned by the respondents, which include difficulties in understanding diverse accents, and also having to access written information in languages other than English. *"People have to write in English because English is the common language for us, but still you can see someone that writes in* [other language]*, and it is a problem for everybody."*

### 6.2.5 Lack of Proper Information Technology

Most of the respondents said that lack of proper information systems is an inhibitor for information flow in Portfolio Management Unit at Alpha. According to the respondents, their jobs demand access to information coming from different sources, and it is lacking an appropriate way to collect, aggregate and record the input given to the Portfolio Management Unit *"if someone mentioned during the last year, something about* [product X], *it is up to me to remember that and have it in the new* [product X] *units. And if I forget, then it is forgotten."* Respondents also mentioned lack of access to key information *"we don't have enough good systems (…) to check real active sales for product.", "we do not have really marketing systems for our products, because what we are using today to prepare product catalogues and such things is a very old fashion database which is actually not up to date."*

There is also a concern about the sales information from the Regional Units. During interviews and observation meetings, the researchers identified that there is a lack of proper reporting tool from the sales to the portfolio management unit. "*Each region has their own system to report, so we don't even have the same part numbers. So there is really really lack of good reporting tools from sales." "For me to get a report about my products today is more or less impossible."*

According to the literature, people have a high influence on information technology, and therefore information technology in organizations can be better understood only in a historical organizational-institutional context (Thomas, 1994). It was identified at Alpha a situation that the systems were in place (formal system), but people just do not use it properly (actual behavior). Therefore the distortion between formal system and actual behavior was higher (Homans, 1950). According to one respondent: *"If you have a data system, but you don't put info in the system, nothing will come out. If people do not put information, information is not available for anybody else. It should be information coming in from the people that are dealing with (…). But they actually do not put information because they do not understand that there are other people that have interest, and which are following up* [the information]*"*

Different factors could be the causes why people do not properly use the information systems that are in place. Self-interest, misunderstanding about how to use the system, and politics issues are some examples of factors that could be the cause of this distortion between formal system and actual behavior.

### 6.2.6 Inadequate Organizational Structures and Processes

A suitable definition about the hierarchy, authority, and unit of command can help the flow of information in organizations (Robbins & Judge, 2007; Fayol, 1949). At Alpha, conflicts due to the lack of unit of command over the Regional Units were identified as inhibitor for information flow. This situation is further explained below.

The Portfolio Management Unit needs figures and also market information from the Region Units. The respondents mentioned that they cannot have access to these figures and information in a systematic way. Even though Regional Units are supposed to report manually its sales and also market information every month to the Portfolio Management Unit (formal system), they have shown resistance to allocate their resources in the preparation of this monthly report (actual behavior). Therefore, it was identified a distortion between formal system and actual behavior.

In fact, one of the causes of this situation is due to the conflict of authority over the Regional Unit. As shown in the Figure 9, the Regional Product Managers from Alpha, who are seated in the Regional Units, report dotted line to the Portfolio Manager and direct to the Regional Sales Director. Therefore, the Product Managers tend to fulfill firstly the requests from the Regional Sales Directors, and secondly the requests from the Portfolio Manager.

This situation illustrates that it is not enough to evaluate the flow of information by only taking into account the information technology and systems in place, because authority and power relation influence the use of information technology and systems (Thomas, 1994; Robbins & Judge, 2007). In the case of Alpha, although it is available the tools needed for the Regional Units to write and to send the monthly report (such as email accounts, computers, and networks), the people that work in the Regional Units are not willing to prepare to report to the Portfolio Management Unit. One reason is that the lack of unit of command over the Regional Unit has as consequence a condition where employees from the Regional Units have to prioritize activities related to sales and jeopardize the preparation of the monthly report.

### 6.2.7 Lack of Time

Time was identified by respondents at Alpha as a barrier for information flow. Some respondents mentioned that they did not have time to share the information properly because they are overloaded *"I'm a stopper because I don't find the time to do everything. (…) I'm a stopper for sure."*

Respondents argued that there are vast requests of information, and they do not have time to process and to share all the information claimed. The respondents emphasized that they are overworked, and this is recognized by the literature as an inhibitor for information flow (Riege, 2005; KPMG, 2000). When asked about what others can do to help his or her work, a respondent answered in a humorous way *"stop calling me."*

Lack of time is a source of distortion between formal system and actual behavior. Respondents claimed that they cannot do more than time allows them. *"I think the biggest problem we have right now is that we are doing too much at the same time. The ambition level is very very high and I don't think the organization is ready to make it happen."*

A different respondent on this time issue express a similar concern "*We have so many activities, but we do not know the priority number one. You can work from early morning to late evening, but you will never meet the expectations (…) still you can do 24 hours per day, it does not help.*" Besides the lack of time, other aspects may also be related to this specific situation, such as lack of resources and lack of priority concerning the demanded activities.

## 6.3 Summarizing Results

The analysis aimed to support this study in answering the question *"What are relevant inhibitors for information flow when managing a global product portfolio?"* From the literature, product portfolio management has been identified as a decision making oriented activity heavily reliant on information. Similarly, data analysis has shown information to be a critical factor in product portfolio management at Alpha.

In the case of Alpha, seven categories of inhibitors emerged from the analysis of empirical data. These inhibitors are *conflicting goals, fear of punishment, lack of trust, geographic distance and language barriers, lack of proper information technology, inadequate organizational structures and processes,* and *lack of time.* The results of the analysis showed that social aspects have high influence on the inhibitors for information flow in product portfolio management.

The concepts of formal system and actual behavior were used to help the analysis of situations when information flow was hindered. The inhibitors identified bring consequences on the information flow process. These consequences can be seen as higher degrees of distortions between formal system and actual behavior. However, it is important to highlight that these distortions can have either positive or negative effects, depending on the basis of judgment (Wickenberg, 2004). Moreover, the implication of distortions needs to be evaluated from a systemic perspective (Deming, 1988), which allows assessing the impact on the overall good of the organization.

# 7 Discussion

*"Information in organizations is not innocent"* (March, 1987)

This chapter aims to investigate further some issues related to the conflicting goals between portfolio management units and sales units, which are included in the section *7.1) Expanding the study of conflicting goals between portfolio management units and sales units*. This chapter also seeks to offer a supplementary examination of the theories applied in this work, which is presented in the section *7.2) Revisiting Theory.*

## 7.1 Expanding the Study of Conflicting Goals between Portfolio Management Units and Sales Units

In this section, issues related to the conflicting goals between portfolio management units and sales units are addressed in three sections. The section 7.1.1 presents the challenges of dealing with distorted information, which is a consequence of conflicting goals between portfolio management units and sales units. The section 7.1.2 attends to draw attention to the conflict involving sales units and portfolio management units and its impact on the product portfolio variety. Finally, the section 7.1.3 concentrates on the discussion about assignment of performance indicators for portfolio management function and sales function, and how these performance indicators can lead to conflicts between these two functions.

### 7.1.1 The Challenges of Dealing with Distorted Information

In the analysis of this study, it was recognized that portfolio units perceive the information from sales units as inaccurate, despite their attempts to formally established guidelines to regulate the information flow. Moreover, sales units do not always follow formal requirements from the portfolio units. This section intends to review, why it is not surprising that the sales units do not follow the guidelines.

The reason behind this sales units' behavior of sending inaccurate information can be linked with the fact that sales units have a goal, which is increasing their profit and their sales. This is the main criterion use to evaluate sales units' performance. However, different markets lead to divergent interests among sales units. As a result, some units that really need the development of a certain product might decide to send estimates to the portfolio unit of price and volumes higher than the reality, in order to influence positively the development of this product. A second group of sales units might decide to send lower estimates, because they do not want to commit with high sales targets when the product becomes available. A third group of sales units that might send the most possible accurate estimates, since they believe in the importance that the portfolio unit has accurate information to make decisions about the global product portfolio.

It is also noticed that sales units are not expected to explicitly admit that they send inaccurate information. It is possible to predict some responses from sales units when the context and parties' interests are recognized. However, the probability that each different type of behavior, or each distortion in information will occurs it still difficult to recognize in advance. Moreover, to what extent the information is distorted is unknown by portfolio managers.

Therefore, this situation blinds portfolio managers about accurate information from the markets. In other words, it increases the information asymmetry between portfolio units and sales units. The inaccurate information is not sanctioned by portfolio unit (formal authority). As a result, this situation is not beneficial for the portfolio unit, since it can prevent the achievement of an efficient global product portfolio, which can be crucial for firms to be competitive in the market.

#### *7.1.1.1 How to Deal with the Problem of Distorted Information?*

A question then emerges: is it possible to solve this problem of distorted information in global product portfolio management? Solving completely the problem is not possible, because diverging interests will always exists in organizations. However, there are some approaches that can reduce the information asymmetry between portfolio managers and sales units.

A scenario to reduce the distorted information can be by eliminating the guideline that sales units have to formally send estimates to portfolio units. Under this scenario, it is expected that portfolio units would get more accurate estimates and transparent information. It might happen because the lack of formality will relieve pressure, at least on sales units that used to send lower estimates, since they will not feel responsible to fulfill the target sales informed to the central unit. Therefore, these sales units might start sending more accurate estimates. However, lack of responsibility about sales targets is *not efficient* for organizational performance. To conclude, reduction of the power

exercised over sales units should be done carefully, and complete removal of control is not suitable, because it can jeopardize the overall good of the organization.

A different scenario to reduce the distorted information is to be aware that self-interest is always active in organizations (Buchanan & Badham, 1999a), and to deal with self-interest successfully. In global product portfolio environment, self-interest from sales units can be aligned with the self-interests of the portfolio unit, so self-interests are not noticed. But when portfolio units' self-interest is different from the self-interest of sales units, conflicts can emerge.

In this case, distortions between the actual behavior (sending of inaccurate information) and the prescribed behavior from the formal system (sending of accurate information) can be explained to a great extent by self-interest. Mapping self-interest of members of the organization helps managers to better predict their behavior.

One approach to know better about the self-interests of sales units it that portfolio managers reduce their power distance and establish closer relationship with sales units (Milliken et al., 2003). In order to reach this closer relationships, portfolio managers can make use of a coaching leadership style, with emphasis on helping the sales unit performance, establishing rapport and empathy , and developing long-term strengths (Goleman, 2000). One constrain for the achievement of closer relationships in global setting is the geographic distance between the parties, since face-to-face communication can facilitate the creation of closer relationships.

Another approach that portfolio managers have to reduce the distorted information is to strive in finding other sources that can be used to verify the validity of the information that they get. Complement the analysis of the validity of the information with official accounting and financial reports can be a valuable strategy. More frequent visits to sales units and customer's sites can also be useful for portfolio managers to have opportunities to access primary data in sales and customers' settings. These personal visits are also helpful for portfolio manager to contrast and evaluate the quality of the information that they receive. However, an existing drawback of this strategy of visiting sales units and customers is the costs of travels. Therefore, an evaluation whether benefits of traveling can compensate expenses should be done on a case-by-case basis.

#### *7.1.1.2 Is it Worthy to Solve the Problem of Distorted Information?*

A quick answer to this question would be: yes, of course! In a first approach to the problem, inaccurate information is recognized as a legitimate concern for decision makers in global product

portfolio setting and in organizations. However, a deeper analysis of the situation is needed to address properly the question.

Even though distorted information is unacceptable when considered in isolation, it is potentially defensible in the context (Buchanan & Badham, 1999b). Some sales units can send inaccurate information and justify this as a legitimate behavior, which might help them to fulfill the interests of their region. Hence, in this perspective, sending distorted information is partially justified.

Furthermore, sales units send distorted information to portfolio units and this situation often increases conflicts between these two functions. When employees face conflicts, they tend to search out new solutions to satisfy the criteria of as many people as possible (Galbraith, 1973). In the case of product portfolio management, distorted information can enhance discussions about whether new features should be included or not in new products, for instance. Then, to some extent, distorted information might have constructive qualities, once conflicts generated by distorted information can enhance discussions that are beneficial for the overall good of the organization.

Therefore, before look for a cure for distorted information, it is wise to evaluate whether the cure is more costly than to live with inaccurate information. Ignoring that the sales units send inaccurate information to portfolio unit is to fail. Nonetheless, in order to have an efficient global product portfolio, it is important to be aware of the distorted information and carefully choose a most suitable approach to deal with this situation.

### 7.1.2 Management of Product Portfolio Variety

The size of the product portfolio in companies varies according to their strategy, some companies emphasize on cost and low variety, others in differentiation and higher variety, and others will have mixed strategies. Variety of products in the portfolios can be beneficial for companies in terms of market positioning, differentiation from competitors, and higher visibility among customers (Lancaster, 1990; Closs et al., 2008). However, dealing with large quantity of products increases costs and often brings supply chain management challenges in developing, purchasing, manufacturing, delivery and support. If proliferation of new products or variants is not controlled, it is likely that product lines grow to a point where the increasing cost of multiple lines of products offsets revenues (Closs et al., 2008).

In the development of this case study, the positive and negative aspects of product variety were noticed. From a *portfolio management unit´s* point of view, high product variety was perceived as a costly practice due to the proliferation of products with low volume of sales. From the *sales units'*

point of view, variety allows them to better serve the different customer segments. Although both groups recognized the difficulties caused by high levels of variety in the portfolio, sales units were to some extent resistant to support the product rationalization efforts of the company. This situation illustrates the conflicting goals between different functions. On one hand some functions emphasize costs efficiency, on the other marketing and sales units might prioritize revenue.

Evaluating the benefits and costs of a new product variant in the portfolio is not an easy task. Benefits of adding variants are not limited to their direct revenues, but also to their contribution to the brand positioning. Likewise, cost analysis of product variants involves different members and systems of the organization. For instance research and development costs of new technologies are hard to assign to a single product, since technologies are often employed in more than one line. Similarly, functional costs derived from marketing, information technologies, and human resources departments are problematic to associate to a particular product or variant.

Because of the difficulty to quantify benefits and costs, decision making in product portfolio in organizations can be one-sided. If the market function has a higher influence in product portfolio decisions, arguments such revenues, brand positioning, and customer satisfaction will have a higher weigh leading to high product variety. In contrast, if functions like finance or manufacturing have higher influence on the product portfolio decisions, efficiency and cost arguments might lead to low product variety. Therefore, managing product variety imposes two important challenges. First, the company strategy must be clear to guide the actions of different functions in the organization. Second, decision makers can benefit from understanding the drivers of the different functions (e.g. cost, sales, efficiency) when processing product requests. Since functions might argue in favor of their own-interests when asking for inclusion or exclusion of products from the portfolio, recognizing this behavior can help decision makers to identify legitimate requests and validate arguments.

### 7.1.3 Alignment of Goals and Performance Indicators

Performance indicators are important because based on them organizations can evaluate its success or the success of its functions. The goals of different functions in the organization need to be aligned with the higher level goals of the organization to avoid conflicting instructions to the members of the organization.

The goals and strategies set in an organization influence the way tasks and work processes are defined, which in turn affects behavior of individuals. Given that businesses' results are a consequence of the emergent behavior of the people, results of the business are linked to the way

task and processes are designed (Shani & Lau, 2009). Additionally, this emergent behavior or actual behavior will influence the way the formal system is established (Homans, 1950).

The establishment of people' performance indicators are one of the processes defined as part of the design of an organization. From an expectancy theory perspective (Vroom, 1964), individuals' acts will depend on the expectation of a given outcome and the value of the outcome for the individual. It means that performance indicators combined with reward mechanisms has a significant impact on the behavior of the individual and consequently in the business result of the organizations.

An effective organization is not a collection of detached individuals who simply look after their own interest; it is a responsible community whose members care about the entire system and its long-term survival (Mintzberg, 2009). If performance indicators are not carefully planned and aligned with the organization goals, people can adjust their behavior to faulty incentives that are detrimental for the organization. For instance, if teachers' performance is linked to the number of students that fail their classes, teachers might stop failing students regardless of the students' results. Likewise, if R&D units are evaluated exclusively in terms of number of new product development without any link to the performance of the products in the market, the number of new product developments might increase. However, the revenues of the organization will not necessarily grow. This evidences the need of a systemic view of the organization when establishing performance indicators.

Similarly, in the case of global product portfolio management, the design of performance indicators for employees is a delicate choice because of its cross-function dependency. Failing to align the different goals of the different functions and the global product portfolio organization can lead to fragmented results. For instance, dispersed sales units usually have performance indicators strongly related to the regional sales and profit, with focus on short term financial results. However, if the performance indicators of product portfolio managers are not related to sales, but to, for instance, rationalization of products in the portfolio, conflicts between portfolio managers and sales units might emerge. On one hand, sales units will strive to have a broad range of products, because they will have more chances to fulfill their local customers' demands. On the other hand, portfolio managers will try hard to reduce the number of variants in the portfolio, to come up with a narrow portfolio, which is less costly to the organization. This situation can lead to lack of cooperation and withholding of information from both sides.

In contrast, if all the functions involved in portfolio management are responsible for similar performance indicators, ambiguity in responsibilities can be perceived by members of the global

organization. It can cause the effect of nobody feeling responsible for problems or poor performance. As well as free riding effects, in which individuals might lower their effort because the same goals and consequent rewards will be shared by the group.

Another difficulty in assigning performance indicators to employees in global product portfolio management arise because this process is closely linked with the firm's strategy. The literature on product portfolio emphasizes the importance of the strategy alignment of the portfolio. It means that the success of product portfolio management is related to the success of the achievement of the strategy of the organization. Therefore, the employees involved in product portfolio management have to have their performance indicators somehow related to the achievement of the firm' strategy. However, appraising the success of the strategy is difficult because strategy success 1) is not realized immediately and it is difficult to plan when it is going to be, 2) is difficult to quantify, and 3) is amalgamated with other factors making it undistinguishable sometimes (Sanchez & Robert, 2010).

Definition of performance indicators is needed in organizations, in spite of the frictions it might create between functions. Designing performance indicators of employees involved in global portfolio management should be done keeping in mind the consequences of overemphasizing particular organizational targets or neglecting others. One way to deal with the diverge performance indicators between portfolio management and sales units is defining performance indicators for portfolio managers that do not jeopardize the achievement of goals for salespeople, and vice versa. For instance, performance indicators might encourage portfolio managers to reduce the variety of the portfolio, as long as the negative effect on sales does not exceed a certain limit. On the other hand, sales units can have a certain variety of products in the portfolio, as long as the costs associated with variety does not rise above a prearranged cost target.

## 7.2 Revisiting Theory

In this section it is revisited the main theory used for analyzing the empirical data of this study. First, a reflection regarding the normative and descriptive theories in product portfolio management is presented. Then, it is revised the applicability of theories related to formal system and actual behavior. Moreover, gaps in theories applied in this work are addressed.

### 7.2.1 Product Portfolio Management Normative and Descriptive Theories

Theory related to product portfolio management was reviewed and used in this study to analyze the actions of practitioners in the field. The theory used in this case study combined normative

approaches (PMI, 2008b; Haines, 2008; Kahn et al., 2005; PDMA, 2006), which facilitates the understanding of how things ought to be when managing product portfolios; and descriptive approaches (Cooper et al., 1999; Cooper et al., 2001; McCarthy et al., 2006; Schmidt & Freeland, 1992), which explains how things actually are in practice.

Normative theories in portfolio management are appealing to practitioners for their ability to structure action and to prescribe what should be done to manage a product portfolio. Such is the case of The Standard for Portfolio Management from the Project Management Institute, which is an example of normative models. Nonetheless, these models disregard to some extent the social factors. Quite the reverse, descriptive literature in the field, such as the study of practices of portfolio management by Cooper (2001), includes as main issue the description of the organizational context in which decisions are made when managing product portfolios.

Both theory approaches, normative and descriptive, proved to be useful and to complement each other during the analysis of the empirical data of this case study. Normative theories provide the fundamentals of portfolio management and the conditions to have an optimal product portfolio. In optimal conditions, information flows transparently between members of the organization allowing decision makers to access all the information required to make the best possible decision. In contrast, descriptive theories do not assume a perfect information flow and highlight the gap between what should be known to make the best possible decision in portfolio management and what is actually known by decision makers.

It is important to notice that normative theories are a key point of departure to study phenomena in fields such as product portfolio management, since they described how the practice ought to be. Descriptive theories in turn contribute to rise above the pure conceptual arguments, by revealing how things are in real contexts and pointing out where normative theory does not hold. *"(… )If we describe things as they are [descriptive approach], we are then likely to agree on changes that will reconstruct things as they ought to be [normative approach]"* (Herson, 1984, p.6). In conclusion, it is suggested in this study that normative and descriptive theories benefit each other and evolve together in a reinforcement cycle.

### 7.2.2 The Need of an Integrated Theory in Formal System and Actual Behavior

The frame of references of this study included theories and concepts related to portfolio management, organizational behavior, and information in organizations, which were used when analyzing the empirical data. In the analysis about the inhibitors for information flow, concepts related to *formal system* and *actual behavior* (Homans, 1950), as well as politics in organizations

(Davenport et al., 2001; Ferris et al., 1989; Buchanan & Badham, 1999a) were proven very useful. Social aspects and individual behaviors were identified as relevant in the evaluation of information flow process, along with organizational structures and information systems.

However, it was identified needs of a theory that integrates four main aspects for this analysis, which are: 1) *formal system and actual behavior,* 2) *politics*, 3) *several stakeholders*, and 4) the *overall good of organizations*. Below, these four factors will be further explained based on their applicability and in the results of this study.

1) *Formal system and actual behavior.* The concepts of formal system and actual behavior, widely applied in the analysis of this study, were built upon the concepts from Homans (1950) of internal system and external system, respectively. For the purpose of this study, the actual behavior means all the acts of the organizational members, while the formal system comprises the prescription of the required behavior imposed on organizational members. The distortion between the formal system and actual behavior always exists. The degree of this distortion between the formal system and actual behavior was one main point for this study. The logic of the analysis was that *the closer the actual behaviors were to the prescription of the formal system, the lower were the distortions in the situations.*

2) *Politics.* The effects of politics in the formal system and actual behavior were recognized in the analysis and results. In order to better understand the reasons why there are distortions in information flow, the presence of political behaviors in organizations were also taken into consideration in the analysis of this study. Political behaviors were considered along with other potential reasons for distortion such as confusion and misunderstanding of formal systems.

3) *Several stakeholders.* The high number of stakeholders involved in global product portfolio settings increased the complexity of the analysis. The concepts formal system and actual behavior were applied in the analysis of people's behaviors when exchanging information. However, the concepts do not fully cover cases where different interests or stockholders influence formal system and actual behavior. These results showed that a theory more appropriated for analyzing the implications of having several stakeholders can facilitate studies in this field.

4) *The overall good of the organization.* The results of this work presents that, in organizational studies, it has to be considered the impact of the distortions between formal system and actual behavior in the overall good of the organization. It is important to notice that achieving the goals of a single function, for instance the portfolio management unit, does not necessarily means that the overall good of the organization is achieved. Therefore, the alignment of the goals of the functions

and of the organization as a whole is essential. In accordance, the results also show that definitions about goals and guidelines in a strategic level have high impact on the information flow and actual behavior of organizational members, which consequently impact on the overall good of the organization.

Due to the high importance of these four aspects and their relatedness when studying inhibitors for information flow, there is needs of a theory that integrates all of them. This integrated theory will facilitate future research in this area.

### 7.2.3 Assessing Critically the Rational and Irrational Model and the New Macro Organizational Design Model

This section will critically assess the New Macro Organizational Design Model and the Rational and Irrational Model from Shani and Lau (2009), which were reviewed in the frame of reference, regarding their applicability in this organizational study about the inhibitors for information flow in product portfolio management.

The Rational and Irrational Model was not completely helpful for this study because it is not clear about whether political behavior in organizations is rational or irrational, see Figure 5. According to Buchanan and Badham (1999a), organizational behavior cannot be fully understood without an understanding of the role of political motives and agendas. Therefore, it is required to take into account the role of politics, when studying organizational behavior. In fact, political behavior is not irrational, but a normal reaction to various organizational situations (Davenport et al., 2001). However, it was identified that political behavior is vaguely addressed in the Rational and Irrational Model.

Although the New Macro Organizational Design Model helped in the analysis of this study, aspects related to the definition of the actual behavior were better address by Homan (1950). The disadvantage of this model is that it does not address that the emergent behavior also affects the decision choices in all stages of the organizational design, for instance, during the decisions about the goals and strategies and tasks, see Figure 4. Moreover, despite the fact that information flow is crucial for the decision choices, political behavior in information flow is not taken into account in this model.

On the other hand, positives aspects of the New Macro Organizational Design Model from Shani and Lau (2009) were noticed. First, the model takes into account the correlation between the design of the organization, the emergent behavior, and the business results. This is beneficial for

organizational studies, since positive business results are crucial for organizations survive. Second, the model highlights decision choices as a vital activity during the whole process of organizational design, which brings to light the high value of information flow when designing organizations.

## 8 Managerial Implications

The findings of the study enabled the identification of a number of relevant implications for managers running global product portfolios. During the study, practitioners recurrently brought forward concerns about the reliability of the information shared between sales unit and central units of companies. Some recommendations aiming at the improvement of information flow in global product portfolio settings are offered below.

- Awareness that self-interest is always active in the processes regulating information flow in companies is central to understand the distortion between required behavior and the actual behavior of individuals. At best self-interest is aligned with the organization goals and it goes unnoticed. However, when the goals of the organization and the goals of the individual are in different directions, self-interest is likely to trigger different behaviors and affect the flow of information.
- When making decisions about the portfolio management and introducing changes in the formal procedures, mapping self-interest of the individual can help managers to better predict the output of these decisions and changes. From this angle, mapping self-interest is seen as a tool to reduce risk and deal with uncertainty in organizations.
- In order to strengthen the information flow between different units of the organization, relationship building strategies and establishment of rapport can be useful. Managers are required to delicately balance their approach to power and information. Managers should be aware that fear of punishment can lead to less transparency in the information received. However, if power exercise is substantially diminished, the effectiveness of the organization can be compromised since shortcomings in performance might be disregarded.
- Different leadership styles will have different effects on the openness of individuals when sharing information. Coaching leadership styles are valuable when developing empathy among the working groups and when dealing with uncertain environments. A different leadership is pacesetting, which strive for high standards in performance and accelerated results. However, under high uncertainty pacesetting might result in frictions and an overall detriment of the working climate. People might feel overwhelmed by the high excellence demands, which might lead to frustration and drop of the group's morale. Thoughtful

balance between different leadership styles is necessary to get the best of people in the organization.

- Having systems and processes in place to manage a global product portfolio is important to facilitate the flow of information. Assuring its correct functionality and promoting proper user utilization is beneficial. Nonetheless, people often do not properly use tools to their full potential. Awareness that self-interest and misunderstandings can be causes of this situation can help companies support better use of the available systems and processes.
- Screening mechanisms, such as frequent visits to sales units and customers' sites can be valuable to access primary data and to develop a better understanding of the context of the different markets worldwide. Although this could be a costly mechanism, benefits associated to information transparency and relationship building should be taking into consideration when evaluating the feasibility of these practices.
- Conflicting goals in the organization has been recognized in this study as an inhibitor for information flow. If the goals of individuals, functions, departments, and organizations are not aligned, room for misunderstanding, confusion and higher levels of distortion in the behavior of the organization are expected to emerge and affect the overall good of the organization.

# 9 Conclusions

This study investigates relevant inhibitors for information flow when managing global product portfolios. Theories in portfolio management were used in the analysis to confirm the high value that information has in this setting. Moreover, theories in organizational behavior were utilized in the analysis to understand the barriers for transparent information flow. In particular, theories related to formal system and actual behavior, and political behavior theory were applied in a complementary way to comprehend the behavior of organizational members when sharing information.

Relevant inhibitors for information flow when managing global product portfolio found in this study are: conflicting goals, fear of punishment, lack of trust, geographic distance and language barriers, lack of proper information technology, inadequate organizational structures and processes, and lack of time. The inhibitors lead to higher distortions between formal system and actual behavior in organizations. In this context, self-interest revealed as a key concept to understand reasons for higher distortions between formal system and actual behavior in portfolio management settings.

A key finding was that higher distortion can be both positive and negative, depending on the perspective used to evaluate. Therefore, it is important that distortions are evaluated in a multi-perspective way, and always taken into account the overall good of the organizations.

Finally, this study confirmed a need of regarding social aspects both in the literature and on the practice of global product portfolio management. Further research is necessary in an integrated theory that deals with politics and distortions between formal and actual behavior, which takes into account several stakeholders and the overall good of organizations.

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## Appendix 1 Interview Guide

The interview guide includes the questions used during the collection of the empirical data of the main case study. This guide contains the main topics covered in the interviews, but it does not include all follow-up questions directed to respondents. The same set of questions was asked to all interviews, except for few questions that regard specific aspects of the central Product Portfolio Unit or specific aspects of the Regional Units.

| **Interview Guide** |
|---|
| **Introduction** |
| Introductory remarks: Students from Chalmers, Master Thesis Work, supervised by Jan Wickenberg |
| Subject: Information flow in product portfolio management |
| Confidentiality: Is it ok to record the interview? You can stop us at any time. It is anonymous, but we might use some quotes. The findings will be presented in a report to the company. |
| **Context** |
| 1. Can you explain your work/position further? Who do you work close with? |
| 2. What advantages related to the current product portfolio can you identified? (Current mix of products) |
| 2.1. What are the disadvantages? |
| 3. In your words, what are the main goals of the global Product Portfolio Unit? |
| **Product Portfolio Information**<br>*(within the interviewee's unit)* |
| 4. Could you tell us about a project you have work recently? (related to product portfolio – product development – product launch) |
| 4.1. How do you report the status of the project to your supervisor? |
| 4.2. How often do you have meetings for this project? |
| 4.3. So far, is there anything that you would have done in a different way? |
| 5. Is there anything that your team can do to facilitate your work? |
| 6. If you could change something about the way your team is working right now? What would you change? |
| 7. Have requests or suggestions from your team been neglected by the top management? |
| 8. What kind of information is difficult to discuss with your team or with the managerial team? |
| 9. In your opinion, what are the inhibitors for the information flow within your team? (Time, trust, lack of commitment, geographic distance, arduous relationship…) |
| 9.1. How open is the discussion about these issues in the organization? |
| 9.2. Do you think your team is aware of these issues? |

| **Information Flow in Product Portfolio**<br>*(between the Product Portfolio Unit and the Regional Units)* |
|---|
| 10. How is your relation with the people from the Regional Units/Product Portfolio Unit? How often do you contact them? Do you know in person everybody that you get information from? |
| 11. Is there anything that the Regional Units /Product Portfolio Unit can do to improve your work related to the product portfolio? |
| 12. What type of information does your unit provide from the Regional Units / the global Product Portfolio Unit? |
| 13. What type of information does your unit receive to the Regional Units / the global Product Portfolio Unit? |
| 13.1. How accurate is the information that you receive from the Regional Units? Information such as volume estimations, sales forecast, competitors analysis (Exclusive Product Portfolio Unit) |
| 13.2. In general, is the information too optimistic, or pessimistic? (Exclusive Product Portfolio Unit) |
| 13.3. Does your team need to confirm or "double check" the information that you receive from the regions? Is it possible to confirm that information? (Exclusive Product Portfolio Unit) |
| 13.4. What kind of information is difficult to obtain from the Regional Units? What are the things that they are not sharing? (Exclusive Product Portfolio Unit) |
| 13.5. Regarding figures, how do you prepare the numbers to present to the global Product Portfolio Unit? Do you use any information system? (Exclusive Regional Units) |
| 14. Considering that people from the regions have their own agenda, do you think that your requests of information are difficult for them to handle, or they see this information exchange as a priority in their work? (Exclusive Product Portfolio Unit) |
| 15. Have requests from your team been neglected by the Regional Units/Product Portfolio Unit? |
| 16. Is there anything that you can do to improve the work for people from the Regional Units/Product Portfolio Unit? |
| 17. In your opinion, what are the inhibitors for the information flow? (Time, trust, lack of commitment, geographic distance, arduous relationship…) |

## Appendix 2 Making Decision in the Absence of Information

Under a rational perspective, decision making is the result of the calculation of future consequences based on current choices and available information. When making decisions in an ideal scenario, decision makers have complete information, know all possible alternatives, and anticipate all possible consequences. However, cognitive limitations, uncertainty, and incomplete information are unavoidable elements of decision making (March, 1994).

A different perspective to decision making recognizes that action is ahead of cognition, which causes uncertainty. In order to deal with uncertainty or ambiguity, plausibility is used instead of accuracy when making decisions. In other words, decision makers do not require accurate hard to access data, but interpret available data (Weick et al., 2005). In line with this perspective, researchers have study the role of intuition and "gut feeling" in decision making. Intuition is defined as "*affectively charged judgments that arise through rapid, non-conscious, and holistic associations"* (Dane & Pratt, 2007, p.40). Or in the words of Gigerenzer (2007), gut feeling is an "*adaptive toolbox with genetically, culturally, and individually created and transmitted rules of thumb*" (Gigerenzer, 2007, p.19).

Research on the field of intuition has shown that under unstable environment, limited facts, and time limitations, intuition can facilitate rapid and effective decision making (Khatri, 2000; Gigerenzer, 2007; Dane & Pratt, 2007). Intuition can be seen as a way to deal with the trade-off between decision accuracy and decision speed. Intuition is regarded as an ability to synthesize information quickly and effectively. In organizations intuition is used to complete tasks that involve high complexity and short time horizons, such as corporate planning or management of emergencies (Dane & Pratt, 2007).

Different aspects affect the effectiveness of intuition in decision making. Experience is recognized as an important factor in the ability to make effective intuitive decisions. The greater the degree of expertise of an individual is in a specific domain, the greater his or her ability to use intuition as an effective approach (Simon, 1987). The nature of the task also influences the effectiveness of intuition in decisions. Judgmental decisions where no objective criteria or demonstrable solution exists (e.g. political, ethical, aesthetic, or behavioral), seem to be better approached by intuition than by rational decision making (Dane & Pratt, 2007). In addition, research in the field recognized that decision makers that have proved to be very efficient in heavily quantitative decisions, not necessarily show the same ability when problems get complex and ambiguous.

In the rapid changing environments that characterize current organizations, intuition represents a necessary approach to decision making. Or in the words of one of the respondents *"[A firm] is like a family, you have to trust the oldest."* As a result, retention of highly experienced individuals becomes even more relevant for organization. In addition, supporting intuition (under appropriate situations) as a valid approach is an important mechanism for organizations to deal with complex and uncertain circumstances.